

1988

KODIAK MANAGEMENT AREA  
ANNUAL HERRING MANAGEMENT REPORT

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# TABLE OF CONTENTS

	<u>Page</u>
LISTS OF TABLES . . . . .	i
LIST OF FIGURES . . . . .	ii
LIST OF APPENDICES . . . . .	iii
KODIAK HERRING SAC-ROE FISHERY . . . . .	1
Area Description . . . . .	1
Historical Perspective . . . . .	1
General . . . . .	1
Fishery Characteristics and Harvest Strategy . . . . .	1
1988 Season Summary . . . . .	4
Effort and Harvest Summary . . . . .	4
The Fishery . . . . .	5
Stock Status . . . . .	12
General . . . . .	12
Spawning Biomass . . . . .	13
1989 Management Plans and Issues . . . . .	14
KODIAK HERRING FOOD/BAIT FISHERY . . . . .	34
Historical Perspective . . . . .	34
General . . . . .	34
Fishery Characteristics . . . . .	34
Harvest Strategy . . . . .	35
1988/89 Season Summary . . . . .	35
Harvest and Effort . . . . .	35
The Fishery . . . . .	36
1989 Management Plans and Issues . . . . .	36
APPENDICES . . . . .	42

## LIST OF TABLES

<u>Table</u>	<u>Page</u>
1. Historical harvest and effort level for the herring sac-roë fishery for the Kodiak Management Area, 1964-1988 . . . . .	3
2. Harvest summary by gear and area for the Kodiak Management Area, 1988 . . . . .	6
3. Kodiak herring sac-roë fishery summary by year and by gear, 1979-1988 . . . . .	10
4. Status of Kodiak sac-roë herring permits . . . . .	11
5. Summary of age composition by percent of Kodiak herring sac-roë stocks, 1988 . . . . .	15
6. Summary of average lengths by age of Kodiak herring sac-roë stocks, 1988 . . . . .	16
7. Summary of average weight by age by bay of Kodiak herring sac-roë stokcs, 1988 . . . . .	17
8. Herring sac-roë fishery A-W-L summary for the Kodiak Management Area, 1988 . . . . .	18
9. Commercial herring fisheries historical harvest levels for the Kodiak Management Area, 1912-1988 . . . .	32
10. Kodiak commercial food/bait herring AWL summaries, 1988-89 . . . . .	37

## LIST OF FIGURES

<u>Figure</u>	<u>Page</u>
1. Kodiak Area herring statistical chart . . . . .	2
2. Kodiak Area herring sac-roe fishery age frequency comparisons by management unit, 1988 . . . . .	19
3. Kodiak Area herring sac-roe fishery age frequency comparisons by management unit by year, 1979-1988 . . .	21
4. Kodiak Management Area herring food/bait fishery statistical chart . . . . .	33

## LIST OF APPENDICES

<u>Appendix</u>	<u>Page</u>
A.1. 1988 Herring Sac-roe Harvest Strategy for the Kodiak Management Area . . . . .	43
A.2 1988/89 Harvest Strategy for the Kodiak Management Area Commercial Food/Bait Herring Fishery . . . . .	62

## KODIAK HERRING SAC-ROE FISHERY

### *Area Description*

The Kodiak Management Area comprises all waters of Alaska from the southern entrance of Imuya Bay near Kilokak Rocks north to Cape Douglas, including Kodiak, Afognak and adjacent islands (Figure 1). This report on the 1988 herring sac-roë fishery was prepared for the March 1989 Board of Fisheries meeting in Juneau.

### *Historical Perspective*

#### General

The Kodiak Area sac-roë fishery began in 1964 and has produced an average annual harvest of 1,314 tons over this 25 year period. Prior to 1977 the fishery was essentially unregulated as to guideline harvest levels (G.H.L.), gear types, seasons, and fishing periods. It was a relatively low value fishery with few participants, all seiners, who concentrated their effort in 4 or 5 bays on Kodiak Island's westside. Annual harvests fluctuated greatly during the fourteen year period between 1964 and 1977 along with effort level, fish abundance, prices, and processor interest. Following the record low harvest years of the mid-1970's came the pivotal years of 1977 and 1978. In 1977, improved market conditions kindled renewed industry interest which was initially confined to a few seiners who began using aircraft successfully. By 1978, the beginnings of the contemporary sac-roë fishery were evident with a noticeably expanded seine fleet using aircraft and tenders. This effort evolved to the very mobile and efficient seine fleet which exists today. In 1978, gillnet gear entered the fishery for the first time.

Since 1977, many proposed regulatory changes and several changes in management strategy have occurred as the fishery went through a rapid development phase. Regulatory changes during this period have dealt with gear efficiency, gear conflicts between seiners and gillnetters, restrictions on gear levels (exclusive registration and limited entry), and closed water areas. The overall effect has been the emergence of a relatively stable commercial sac-roë fishery on very small stocks during a period of moderate stock abundance, all in the face of increasingly efficient gear. This is best illustrated by the data presented in Table 1.

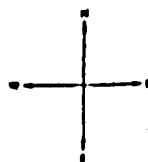
#### Fishery Characteristics and Harvest Strategy

The current Kodiak sac-roë fishery occurs in dozens of bays and isolated coastal locations during a seven to eight week period extending from mid-April to mid-June. The fishery opens by regulation on a specific date (April 15), and the entire management

# KODIAK AREA HERRING STATISTICAL CHART

REVISED 1 MARCH 1965

THIS CHART IS PRINTED AS A COURTESY BY A D.F. & G. AND IS INTENDED PRIMARILY AS A GUIDE FOR FISHERMEN AND INDUSTRY PERSONNEL TO USE WHEN REPORTING ON FISH TICKETS THE CORRECT STATISTICAL CATCH AREAS FOR EACH COMMERCIAL HERRING DELIVERY. FOR EXACT DESCRIPTIONS OF DISTRICTS AND SUBSECTIONS, CONSULT THE CURRENT ISSUE OF THE ALASKA COMMERCIAL FISHING REGULATIONS FOR HERRING.



## MAINLAND DISTRICT

- M010 NORTH MAINLAND
- M020 INNER ALASKA
- M030 OUTER ALASKA
- M040 MISSISSA
- M050 INNER KATHAI
- M060 OUTER KATHAI
- M070 ALASKA
- M080 PALE BAY
- M090 PORTAGE BAY
- M100 OUTER PORTAGE BAY
- M110 WIDE BAY
- M120 LOWER SHELTER

## LEWIS DISTRICT

- LC010 LEWIS AND
- LC020 VILLAGE
- LC030 TERNUM
- LC040 VILLAGE ISLAND
- LC050 W. LEANER PASS
- LC060 NE. AMI LEANER
- LC070 E. AMI LEANER
- LC080 S. AMI LEANER
- LC090 OFFSHORE LEANER

## UNAK DISTRICT

- UN010 OFFSHORE UNAK
- UN020 MARISTON ISLAND
- UN030 INNER UNAK
- UN040 LARSEN BAY
- UN050 ZACHAR BAY
- UN060 SPIRIT BAY

## STRECHOWITZ DISTRICT

- SH010 NO SUBSECTIONS

## ALITAK DISTRICT

- AL010 OUTER ALITAK
- AL020 INNER ALITAK
- AL030 DEATH BAY
- AL040 SIKIN/PORTAGE BAY
- AL050 LOWER OGA/HOLDER BAY
- AL060 UPPER OGA BAY
- AL070 GLESE/THORADO

## AFONNAK DISTRICT

- AO010 RASPBERRY STRAITS
- AO020 MALINA BAY
- AO030 PARANOW BAY
- AO040 FOX BAY
- AO050 BLUE FOX
- AO060 OFFSHORE WEST, AFONNAK
- AO070 SHANAK ISLAND
- AO080 PERHOSA BAY
- AO090 DELPHIN BAY
- AO100 SEAL BAY
- AO110 TOWNE BAY
- AO120 LIZARD BAY
- AO130 KITOI BAY
- AO140 MC DONALD LAGOON
- AO150 DANER BAY
- AO160 LITHIK
- AO170 INKORE PAVOT

## GENERAL DISTRICT

- GO010 KATUNAK
- GO020 W. SITKALIDAK STRAITS
- GO030 BARLING
- GO040 E. SITKALIDAK STRAITS
- GO050 TANGINAK AND RAGE
- GO060 OUTER SITKALIDAK
- GO070 OUTER KILLIDA
- GO080 INNER KILLIDA
- GO090 SHEARATER
- GO100 OUTER UGAR
- GO110 INNER UGAR
- GO120 WOMEN'S BAY
- GO130 MEYAD KAYHILL BAY
- GO140 ANTON LARSEN
- GO150 SHERRATTIN
- GO160 KILIKAK
- GO170 KALISIN BAY
- GO180 MIDDLE BAY
- GO190 INKORE CHINIAK
- GO200 SPRUCE ISLAND

FIGURE 1.

Table 1. Historical harvest and effort level for the herring sac-roë fishery for the Kodiak Management Area, 1964-1988.

YEAR	TONS HARVESTED	SEINE	GILLNET	NUMBER of CO'S	NUMBER OF VESSELS			TOTAL
					TRAWLS	GILLNET	SEINE	
1964	567.8	567.8	-	2	0	0	5	5
1965	657.2	657.2	-	2	0	0	8	8
1966	2,769.3	2,769.3	-	4	0	0	11	11
1967	1,662.4	1,662.4	-	4	0	0	5	5
1968	2,000.6	2,000.6	-	4	0	0	10	10
1969	1,130.0	1,130.0	-	9	0	0	21	21
1970	341.6	341.6	-	5	0	0	13	13
1971	284.3	284.3	-	2	0	0	4	4
1972	215.0	215.0	-	1	0	0	4	4
1973	831.0	831.0	-	4	0	0	11	11
1974	868.0	868.0	-	4	0	0	26	26
1975	8.0	8.0	-	3	0	0	2	2
1976	4.6	4.6	-	1	0	0	1	1
1977	338.4	338.4	-	3	0	0	11	11
1978	903.6	880.6	23.0	7	2	7	28	35
1979	1,735.1	1,457.2	277.9	8	0	125	57	182
1980	2,383.0	2,009.0	374.0	9	1	109	92	201
1981	2,065.4	1,596.2	469.2	9	0	114	79	193
1982	1,770.6	1,447.0	323.6	6	0	67	45	112
1983	2,318.5	1,796.9	521.6	7	0	64	41	105
1984	2,162.7	1,691.2	471.5	7	0	69	39	108
1985	1,967.7	1,244.2	723.5	7	0	81	34	115
1986	1,558.4	1,110.8	447.6	8	0	71	31	102
1987	2,145.9	1,591.3	554.6	8	0	62	29	91
1988	2,171.0	1,303.5	867.5	6	0	76	33	109
TOTALS	32,860.1	27,806.1	5,040.0					
AVERAGE	1,314.4	1,112.2	459.46					

area is opened at that time, excluding those stocks requiring biological protection. Roe recovery, weather conditions, and effort levels are not considered unless it is obvious wastage may occur. Fishing periods are set by emergency order and normally extend for 24 hours beginning at 12:00 noon on odd numbered days. The 24-hour closures which begin at 12:00 noon on even numbered days are a critical management tool which allow management staff time to assess harvest, gear concentrations, herring biomass estimates, and relocate field crews if necessary. Legal gear for this fishery is purse seines (100 fathoms maximum length and a maximum 1,000 meshes in depth), and gillnets (aggregate length may not exceed 150 fathoms). Limited entry has been in effect since 1981, however gear levels still fluctuate somewhat because transferable permit levels haven't been finalized.

A unique characteristic of this fishery is that the fishery commences prior to any major build-up of fish. This allows for a more general distribution of effort and conceptually a slower rate of harvest on these small stocks, at least at current abundance levels. Throughout the season, the entire fleet is allowed to roam independently in search of potential harvest locations. Both gillnet and seine gear fish the same grounds. There are no area or time separations by the different gear types. Monitoring of pre-harvest movements of both herring schools and commercial gear is critical to management activity. Even though the annual harvest is distributed between 40-50 management units (stocks) there is a general sequence of harvest timing by groups of these units. This allows ADF&G to distribute on the grounds monitoring effort into the most likely harvest locations. Frequent ADF&G aerial surveillance of the entire area, supplements and actually directs in-season changes in the monitoring effort; commercial spotter reports provide invaluable information on all facets of the fishery and remain vitally important to management activities.

This sac-roe fishery annually yields one of the higher ex-vessel values per ton in the State. Competition among shore-based processors is probably a major factor combined with inherent high quality of fish. The high quality of fish product is obtained from in-season handling of a relatively small quantity of fish over a long period of time; this has provided Kodiak herring with a good reputation which yields maximum returns to the industry.

#### *1988 Season Summary*

##### *Effort and Harvest Summary*

During a 59 day period extending from April 15 through June 12 a total of 2,171 short tons of sac-roe herring were harvested. The average roe recovery was approximately 10% and the average ex-vessel price was \$1,300 per ton for 10% recovery. The total estimated ex-vessel value of the fishery was 2.82 million dollars.

Industry effort involved 33 seiners and 76 gillnetters delivering to six different processors. Of the total 2,171 tons harvested, seiners harvested 1,304 tons (60%) from 169 landings and gillnetters harvested 867 tons (40%) from 555 landings. The average earnings by gear type was \$51,350 for seiners and \$14,837 for gillnetters. A further breakdown of the 1988 season by gear type by management unit is presented in Table 2.

Referring to Table 3 for comparison purposes, it should be noted that only the past ten years are shown because these years represent the years of highest gear and harvest levels which probably represent a grouping of years whose average harvest level may be sustained for the foreseeable future (Tables 1 and 3).

The trends in gear levels show an increase through 1980 and then a decrease through 1987, a period when gear expansion was either restricted or not beneficial for future Limited Entry permit considerations. The total amount of gear making landings in 1988 increased from the low of 91 units in 1987 to 109 units. Although in 1988, increases in both gear types were documented, gillnet permit holders accounted for a majority of the increase.

As shown in Table 4, transferable permits for both gear types is still increasing as the Limited Entry Commission continues it's determinations on participants who may qualify for a transferable permit.

The number of landings made by both gear types increased in 1988 compared to 1987. The 169 landings made by seine gear was still below the record 207 landings made in 1981. The record 511 landings made in 1988 by gillnet gear was well above the previous high of 411 landings in 1987. The increasing trend in gillnet landings may primarily be a result of the increased knowledge of the fishery, better equipment and an increase in the tendering service available to the gillnet fleet.

The trend in overall harvest during the past ten years has been relatively stable, averaging approximately 2,000 tons per year. Prior to 1978, the entire sac-roe harvest was taken by seine gear. Since 1979, the harvest percent by seine gear has ranged from a high of 84% in 1979 to 60% in 1988 with 75% being the recent ten year average. In 1988, gillnet harvest percent was 40% which is above the low of 16% in 1979 and 1980, and well above the recent ten year average of 25%. The increase in gillnet efficiency can be associated with the predominant weather conditions during a particular season, improved knowledge of specific bay timings, increased use of fish finding electronics, and improvements in gear and vessels.

### The Fishery

In 1988, the fishery was regulated by the issuance of 29 emergency orders (E.O.'s) of which one initiated the weekly fishing periods

Table 2. Harvest summary by gear and area for the Kodiak Management Area, 1988.

MANAGEMENT UNITS			PURSE SEINE			GILLNET			TOTAL		MGNT. UNIT CLOSURES <sup>1</sup>	
NO.	NAME	G.H.L.	TONS	LNDG	%	TONS	LNDG	%	TONS	LNDGS	DATES	E. O.
A010	RASPBERRY	45	40.00	-	84.9	7.10	-	15.1	47.10	-	16-MAY	-
A020	MALINA	20	49.50	-	94.5	2.90	-	5.5	52.40	-	18-APR	-
A031	PARAMANOFF	25	40.80	-	76.4	12.60	-	23.6	53.40	-	18-APR	-
A032	FOUL BAY	20	0.00	-	0.0	3.40	-	100.0	3.40	-	22-APR/08-MAY	-
A040	BLUE FOX	20	0.00	-	0.0	1.50	-	100.0	1.50	-	30-JUN	-
A050	OFFSHORE AFOG.	-	-	-	-	-	-	-	-	-	30-JUN	-
A060	SHUYAK	20	0.00	-	-	0.00	-	-	0.00	-	30-JUN	-
A070	PERENOSA	15	11.20	-	58.6	7.90	-	41.4	19.10	-	24-APR	-
A071	DELPHIN	10	0.00	-	0.0	4.60	-	100.0	4.60	-	30-JUN	-
A072	SEAL BAY	10	0.00	-	-	0.00	-	-	0.00	-	30-JUN	-
A080	TONKI	10	16.90	-	100.0	0.00	-	0.0	16.90	-	20-MAY	-
A090	IZHUT	15	20.30	-	100.0	0.00	-	0.0	20.30	-	20-APR	-
A091	KITOI	15	2.50	-	18.5	11.00	-	81.5	13.50	-	30-JUN	-
A092	MCDONALDS	10	1.90	-	17.9	8.70	-	82.1	10.60	-	11-MAY	-
A100	DANGER	30	7.30	-	18.0	33.30	-	82.0	40.60	-	24-APR	-
A101	LITNIK	15	6.10	-	35.9	10.90	-	64.1	17.00	-	14-MAY	-
A102	INSHORE MARMOT	10	0.00	-	-	0.00	-	-	0.00	-	30-JUN	-
AFOGNAK TOTALS			290	196.5	-	65.4	103.9	34.6	300.40	-		

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Table 2. (page 2 of 4)

MANAGEMENT UNITS			PURSE SEINE			GILLNET			TOTAL		MGNT. UNIT CLOSURES <sup>1</sup>	
NO.	NAME	G.H.L.	TONS	LNDG	%	TONS	LNDG	%	TONS	LNDGS	DATES	E. O.
UG10	KUPREANOF	10	0.00	-	0.0	1.70	-	100.0	1.70	-	30-JUN	-
UG20	VIEKODA	20	11.90	-	47.8	13.00	-	52.2	24.90	-	02-MAY	-
UG21	TERROR	65	107.70	-	100.0	0.00	-	0.0	107.70	-	22-APR	-
UG30	VILLAGE ISLAND	25	17.10	-	64.5	9.40	-	35.5	26.50	-	25-APR	-
UG31	W.UGANIK PASS	15	1.40	-	4.3	31.40	-	95.7	32.80	-	25-APR	-
UG32	N.E.ARM	60	55.00	-	73.5	19.80	-	26.5	74.80	-	01-JUN	-
UG33	EAST ARM	30	21.80	-	48.4	23.20	-	51.6	45.00	-	25-APR	-
UG34	SOUTH ARM	30	40.70	-	91.9	3.60	-	8.1	44.30	-	28-APR	-
UG40	OFFSHORE UGAN.	-	-	-	-	-	-	-	-	-	30-JUN	-
UGANIK TOTALS			225	255.6	-	71.5	102.1	-	28.5	357.70	-	-
SH10	STURGEON	EXPLOR.	-	-	-	-	-	-	-	-	30-JUN	-
STURGEON/HALIBUT TOTA			-	-	-	-	-	-	-	-	-	-
UY10	OFFSHORE UYAK	-	-	-	-	-	-	-	-	-	30-JUN	-
UY20	HARVESTER	10	0.00	-	0.0	0.60	-	100.0	0.60	-	30-JUN	-
UY30	INNER UYAK	210	114.80	-	50.8	111.10	-	49.2	225.90	-	06-MAY/10-MAY	-
UY31	LARSEN BAY	10	0.00	-	0.0	0.70	-	100.0	0.70	-	30-JUN	-
UY40	ZACHAR	100	5.60	-	4.9	108.20	-	95.1	113.80	-	09-MAY	-
UY50	SPIRIDON	160	85.60	-	54.3	71.90	-	45.7	157.50	-	18-MAY	-
UYAK TOTALS			490	206.0	-	41.3	292.5	-	58.7	498.5	-	-

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Table 2. (page 3 of 4)

MANAGEMENT UNITS			PURSE SEINE			GILLNET			TOTAL		MGNT. UNIT CLOSURES <sup>1</sup>	
NO.	NAME	G.H.L.	TONS	LNDG	%	TONS	LNDG	%	TONS	LNDGS	DATES	E. O.
AL1	OUTER ALITAK	-	-	-	-	-	-	-	-	-	30-JUN	-
AL20	INNER ALITAK	EXPLOR.	0.00	-	0.0	2.70	-	100.0	2.70	-	30-JUN	-
AL20	DEADMAN	100	104.90	-	100.0	0.00	-	0.0	104.90	-	12-MAY	-
AL30	SULUA	40	38.70	-	80.6	9.30	-	19.4	48.00	-	14-MAY	-
AL40	LOWER OLGA/MOSER	0	CLOSED	-	-	CLOSED	-	-	-	-	CLOSED	-
AL50	UPPER OLGA BAY	190	106.60	-	55.7	84.80	-	44.3	191.40	-	12-JUN	-
AL60	GEESE/2 HEADED	EXPLOR.	7.00	-	100.0	0.00	-	0.0	7.00	-	30-JUN	-
ALITAK TOTALS			330	257.2	-	72.7	96.8	-	27.3	354.00	-	
G010	KAIUGNAK	10	22.80	-	100.0	0.00	-	0.0	22.80	-	10-MAY	-
G020	W. SITKALIDAK	EXPLOR.	25.00	-	100.0	0.00	-	0.0	25.00	-	20-APR	-
G021	BARLING	15	17.70	-	100.0	0.00	-	0.0	17.70	-	19-APR	-
G022	E. SITKALIDAK	75	68.20	-	73.6	24.50	-	26.4	92.70	-	18-APR	-
G023	TANGINAK	15	0.00	-	0.0	6.40	-	100.0	6.40	-	30-JUN	-
G030	OUTER SITKAL.	-	-	-	-	-	-	-	-	-	30-JUN	-
G040	OUTER KILIUDA	EXPLOR.	0.00	-	0.0	4	-	100.0	4.00	-	30-JUN	-
G041	INNER KILIUDA	10	6.90	-	100.0	0	-	0.0	6.90	-	04-MAY	-
G042	SHEARWATER	15	1.40	-	8.5	15.10	-	91.5	16.50	-	04-MAY	-
G050	OUTER UGAK	EXPLOR.	33.40	-	96.5	1.20	-	3.5	34.60	-	24-APR	-
G051	INNER UGAK	40	23.70	-	78.7	6.40	-	21.3	30.10	-	18-MAY	-
G060	WOMENS BAY	90	6.70	-	7.5	82.90	-	92.5	89.60	-	18-MAY	-
G070	MONASHKA	EXPLOR.	-	-	-	-	-	-	-	-	30-JUN	-
G080	ANTON LARSEN	30	0.60	-	2.9	20.10	-	97.1	20.70	-	30-JUN	-

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Table 2. (page 4 of 4)

MANAGEMENT UNITS			PURSE SEINE			GILLNET			TOTAL		MGNT. UNIT CLOSURES <sup>1</sup>	
NO.	NAME	G.H.L.	TONS	LNDG	%	TONS	LNDG	%	TONS	LNDGS	DATES	E. O.
G081	SHERATIN	15	0.00	-	0.0	0.50	-	100.0	0.50	-	30-JUN	-
G090	KIZHUYAK	90	43.30	-	39.8	65.60	-	60.2	108.90	-	28-APR	-
G100	KALSIN	20	4.50	-	86.5	0.70	-	13.5	5.20	-	30-JUN	-
G101	MIDDLE BAY	25	0.90	-	21.4	3.30	-	78.6	4.20	-	30-JUN	-
G102	INSHORE CHINIAK	10	-	-	-	-	-	-	-	-	30-JUN	-
G103	SPRUCE ISLAND	10	0.00	-	0.0	0.60	-	100.0	0.60	-	30-JUN	-
GENERAL DISTRICT TOTA			470	255.1	-	52.4	231.3	-	47.6	486.40	-	
M010	NORTH MAINLAND	EXPLOR.	-	-	-	-	-	-	-	-	30-JUN	-
M020	INNER KUKAK	50	35.60	-	46.4	41.20	-	53.6	76.80	-	19-MAY	-
M030	OUTER KUKAK	-	-	-	-	-	-	-	-	-	30-JUN	-
M040	MISSAK	-	-	-	-	-	-	-	-	-	30-JUN	-
M050	INNER KATMAI	50	36.90	-	97.6	0.90	-	2.4	37.80	-	30-JUN	-
M060	OUTER KATMAI	-	-	-	-	-	-	-	-	-	30-JUN	-
M070	ALINCHAK	30	32.30	-	100.0	0.00	-	0.0	32.30	-	19-MAY	-
M080	PUALE	-	-	-	-	-	-	-	-	-	30-JUN	-
M090	PORTAGE	-	-	-	-	-	-	-	-	-	30-JUN	-
M110	WIDE BAY	100	26.70	-	100.0	0.00	-	0.0	26.70	-	30-JUN	-
MAINLAND TOTALS			230	131.5	-	75.7	42.1	-	24.3	173.60	-	
KODIAK TOTALS			2065	1303.60	-	60.1	867.20	-	39.9	2170.80	-	

<sup>1</sup> All closure dates of 30-Jun indicate those management units which were not closed in-season; they closed at season's end.

Table 3. Kodiak herring sac-roe fishery summary by year and by gear, 1979-1988.

YEAR	SEASON LENGTH (DAYS)	TOTAL HARVEST	BY GEAR		PERCENT		LANDINGS		NO. UNITS		AVG. \$'S	
			SEINE	G/N	SEINE	G/N	SEINE	G/N	SEINE	G/N	SEINE	G/N
1979	36	1,735	1,457	278	84	16	-	-	57	125	38,347	3,333
1980	35	2,383	2,009	374	84	16	-	-	92	109	14,978	2,573
1981	48	2,065	1,596	469	77	23	207	406	79	114	14,402	3,471
1982	59	1,771	1,447	324	82	18	138	191	45	67	17,819	2,719
1983	51	2,319	1,797	522	78	22	164	284	41	64	35,061	6,520
1984	54	2,163	1,691	472	78	22	138	212	39	69	34,691	5,467
1985	59	1,968	1,244	724	63	37	118	348	34	81	32,935	8,039
1986	61	1,558	1,110	448	71	29	132	385	31	71	34,010	6,002
1987	61	2,146	1,591	554	74	26	122	411	29	62	54,872	8,945
1988	59	2,171	1,304	867	60	40	169	555	33	76	51,350	14,837
10 YEAR AVG.	52	2,028	1,525	503	75	25	148	349	48	84	32,847	6,191

Table 4. Status of Kodiak sac-roe herring permits.

	Year	
	1987	1988
Gill Net Transferable	59	63
Gill Net Non-transferable	48	41
Gill Net Total	<u>107</u>	<u>104</u>
Gill Net Fished	62	76
Seine Trasferable	40	45
Seine Non-transferable	26	24
Seine Total	<u>66</u>	<u>69</u>
Seine Fished	29	33
TOTALS		
Transferable	99	108
Non-transferable	74	65
Total	<u>173</u>	<u>173</u>
Fished	91	109

and opening/closing times for each period. Twenty-eight E.O.'s were used to close specific management units.

There are 72 management units currently described for the Kodiak Management Area. In 1988, 53 of those units were exploited during the sac-roe fishery. A further breakdown (Table 2) shows that 35 of those units were closed in-season by E.O. Harvests occurred in the remaining 18 units, but not to the level requiring in-season closure. Of the 19 management units in which no harvest occurred, seven were offshore units and would not be expected to have sac-roe harvests, the remaining twelve inshore management units have had little, if any, historical sac-roe harvest.

In the 53 units where harvests occurred, 11 were exploited exclusively by seine gear and 11 were exploited exclusively by gillnet gear.

Geographically, the distribution of the herring harvest was similar to recent past years. A guideline harvest level of 2,065 tons from "traditional" harvest areas (Table 2), was projected in the 1988 sac-roe management plan (Appendix A.1). The overall harvest of 2,171 tons was 106 tons higher than the pre-season G.H.L. Approximately 73 tons was harvested from management units which are listed as exploratory with no set G.H.L.

As in years past, up to seven herring crews, outfitted with Single Side Band and Marine VHF radios, inflatable rafts, 10-15 h.p. outboards, tents, personal flotation gear, miscellaneous camping gear and survival equipment along with one ADF&G 40 foot vessel, were used to monitor the major herring fisheries throughout the season. Twenty four hour closures following the twenty four hour openings, along with industry cooperation, effort and biomass surveys flown by the management staff and reports from the herring field crews are all necessary in maintaining the "small stock" management strategy currently in effect.

Reductions in the number of herring crews available, changes in fishing periods, or diminished industry cooperation could result in management changes (additional restrictions, closures, etc.) which in turn would significantly alter the "free roaming" sac-roe fishery which permit holders are currently accustomed.

Subsistence/Personal Use Permits are issued to persons who want to obtain their own bait during the sac-roe season. Of the 58 permits issued this year, eight have been returned, accounting for approximately 1.5 tons of herring harvested.

### *Stock Status*

#### *General*

The current management strategy, which has evolved with the recent expansion (the last 9 years) of this fishery, considers each

management unit as a stock. These geographic units represent relatively predictable stocks of herring relative to estimated biomass, age composition (excluding recruitment), growth (in a broad sense), timing and migration patterns of spawning and spawning locations. The relatively small stocks associated with these units are very vulnerable to excessive harvest when considering their predictability, the efficiency of the seine and gillnet fleet, and the strategy which allows effort to initiate fishing activity within established fishing periods. Adequately regulating the annual harvest on each stock is accomplished by establishing prudent guideline harvest levels and by implementing objective in-season evaluations of stock performance and fishery performance to justify the actual harvest on each stock.

### Spawning Biomass

In 1988 the spawning biomass index for that portion of the Kodiak Area fished was approximately 5,500 tons, as determined by ADF&G surveys. The sac-roe harvest of 2,171 tons represented a total indexed exploitation rate of 28%. This compares favorably with past years exploitation rates which have ranged from 28% in 1983 to 41% in 1986.

These exploitation rates should be qualified, in that ADF&G's annual observations represent an unknown and undoubtedly highly variable proportion of the actual biomass. Nevertheless, these exploitation rates can be used for trend evaluation, but they should not be compared to the spawning biomass indices achieved by ADF&G in Prince William Sound, Cook Inlet and the Bering Sea where each has a relatively large biomass available for aerial indexing and where that portion of the observed biomass is annually less variable, i.e. there is greater opportunity for observing a greater and more consistent proportion of the actual total biomass.

Consequently, the exploitation rates achieved in those fisheries would be more meaningful and comparable between each area's fisheries.

The indexed exploitation rate associated with the Kodiak fishery exceeds the maximum desired exploitation rate of 20%, however it represents a rate based upon observing a significantly smaller proportion of the population than is observed in the aforementioned fisheries. It has been estimated by both staff and commercial spotter pilots, that as little as one-quarter to one-half of the actual biomass is observed for Kodiak Area stocks. This is a result of the relatively low biomass levels of these stocks, the numerous small schools associated with each stock, the long duration of time over which the entire spawning biomass for each stock disperses its spawning effort, and the amount of dedicated aerial effort expended by both ADF&G and commercial spotters during the duration of spawning period which extends from approximately early April to early August.

In 1988, age 4 and 5 year old herring accounted for 74.4% of the commercial harvest. Age 3 herring, or recruit herring, accounted for 6.7% of the commercial harvest. Considering the good recruitment seen in 1988, the Kodiak Area biomass, in general, appears to be on a healthy trend. (Additional AWL data is available in Tables 5-8 and Figures 2 and 3.) In 1989, the G.H.L. for the entire area, although not yet finalized should be approximately 2,000 tons.

Age composition, aerial biomass estimates, stock and fishery performance are all indicators that the Kodiak Area biomass should continue to support a stable sac-roe fishery during the upcoming years.

Other indicators that point toward favorable "spawner" escapements, which are less quantifiable, are trends in increased spawn sightings and new areas utilized for spawning. Also apparent is the continued good survival of spawn as evidenced by fishermen reports of increased observations of schools of juvenile herring.

#### *1989 Management Plans and Issues*

The 1989 sac-roe management plan is expected to be similar to those plans in effect since 1982. The guideline harvest levels for the various stocks will reflect stock status and the harvest strategy will be based upon the Kodiak ADF&G's ability to continue to manage the fishery as it has in past years; which hinges on continued budgetary support. Based on the trends in both stock and fishery performance, the 1989 G.H.L. should approximate 2,000 tons. The final figure will be available when the 1989 management plan is distributed in March.

Three new regulations will be in effect in 1989 that were a result of Board action in March 1987. Affecting gillnet fishermen are changes in marker buoy requirements and transportation of vessels and gear. A new regulation prohibiting the possession of herring which number more than 250 fish per 50 pound sample will primarily affect the purse seine fishermen.

Additional issues which will continue to affect the fishery will be the eventual disposition of permanent transferable limited entry permits, the degree of in-season cooperation between ADF&G and processors, fishermen and spotter pilots and the extent to which conflicts between seine and gillnet gear persist.

Temporary effort increases imposed on the Kodiak Area by seine combines which are geared for the much larger sac-roe fisheries in P.W.S., Cook Inlet and Bristol Bay along with the allocation of Kodiak's sac-roe harvest between the gear types are issues which may be before the Board in the fall of 1989.

Table 5. Summary of age composition by percent of Kodiak herring sac-roes stocks, 1988.

STOCK NAME	GEAR TYPE	HARVEST DATE	AGE COMPOSITION (%)										N
			2	3	4	5	6	7	8	9	10	11+	
Raspberry Straits	1	5/1-5/15	.2	14.4	75.1	7.2	-	.4	1.8	.9	-	-	457
Malina Bay	1	4/18	-	2.4	81.8	8.2	1.8	3.5	-	.6	1.8	-	170
Paramanof Bay	1	4/17	-	3.9	82.3	5.0	1.1	2.8	3.3	-	1.1	.6	181
Perenosa Bay	1	4/23	-	10.3	75.0	5.1	.7	4.4	4.4	-	-	-	136
Long Tonki Bay	1	5/20	-	5.8	85.4	4.9	1.0	-	2.9	-	-	-	103
Izhut Bay	1	4/19-4/20	-	-	69.4	18.0	-	4.5	5.4	1.8	-	.9	111
Danger Bay	1	4/20-4/24	-	9.5	50.3	22.4	-	10.9	2.7	3.4	-	.7	147
Litnik Bay	1	5/14	-	-	12.5	25.0	-	43.8	12.5	-	4.2	2.1	48
Kupreanof Straits	1	5/20	-	.9	39.3	20.5	1.7	5.1	6.8	25.6	-	-	117
Viekoda Bay	1	5/2	-	10.0	87.0	3.0	-	-	-	-	-	-	100
Terror Bay	1	4/21	-	4.5	92.7	2.2	.6	-	-	-	-	-	178
Village Island	1	4/24	-	.7	50.7	31.3	.7	3.3	6.0	7.3	-	-	150
N.E. Arm Uganik	1	4/30-5/22	-	8.0	42.9	22.9	-	.6	13.7	10.9	.6	.6	175
E. Arm Uganik	1	4/25	-	8.1	70.6	19.8	.5	1.0	-	-	-	-	197
S. Arm Uganik	1	4/26-4/28	-	13.8	79.8	5.6	-	-	.8	-	-	-	376
Inner Uyak Bay	1	5/3-5/7	.4	4.5	42.2	17.0	.4	4.0	3.6	26.9	.4	.4	223
Spiridon Bay	1	4/28-5/3	-	6.3	39.6	15.3	-	4.2	5.6	28.5	.7	-	144
Zachar Bay	1	5/2	-	10.9	83.7	2.3	-	.8	1.6	-	-	.8	129
Deadman Bay	1	5/11	-	7.4	68.1	22.2	-	2.2	-	-	-	-	135
Sulua Bay	1	5/13	.6	13.2	50.3	34.9	.6	.6	-	-	-	-	167
Olga Bay	1	5/25-6/9	2.0	13.2	35.8	24.8	1.0	12.3	3.6	5.3	.7	1.3	302
Amee Bay	1	4/17-4/18	-	1.6	35.1	17.5	.8	19.1	13.9	9.6	1.6	.8	251
Barling Bay	1	4/19	-	-	47.7	13.8	.8	15.4	10.8	10.0	-	1.5	130
Outer Kiliuda Bay	1	5/1	-	1.9	29.6	33.3	-	18.5	5.6	9.3	1.9	-	54
Inner Kiliuda Bay	1	4/27-4/29	-	-	24.0	40.0	-	20.0	6.0	9.0	1.0	-	100
Shearwater Bay	1	4/30	-	-	35.2	39.8	-	13.6	6.8	4.5	-	-	88
Outer Ugak Bay	1	4/24	-	1.4	7.2	33.3	1.4	34.8	17.4	4.3	-	-	69
Ugak Bay	1	4/27	-	-	5.0	21.0	1.0	64.0	5.0	4.0	-	-	100
Middle Bay	1	4/20	-	-	37.9	9.1	1.5	25.8	24.2	-	-	1.5	66
Women's Bay	1	5/10	-	-	2.1	31.3	2.1	50.0	10.4	4.2	-	-	48
Sheratin Bay	1	5/20	-	1.5	37.9	13.6	6.1	19.7	1.5	18.2	1.5	-	66
Kizhuyak Bay	1	4/20-4/27	-	.9	86.2	7.4	.5	.9	2.3	1.4	.5	-	217
Kashvik Bay	1	5/10-5/23	-	8.9	57.0	11.9	1.7	4.3	4.7	1.3	2.6	7.7	235
Alinchak Bay	1	5/19	-	9.6	79.5	7.2	-	1.2	1.2	-	-	1.2	83
Wide Bay	1	5/18	-	2.1	64.2	26.3	1.1	-	2.1	-	-	4.2	95

Table 6. Summary of average lengths by age of Kodiak herring sac-roe stocks, 1988.

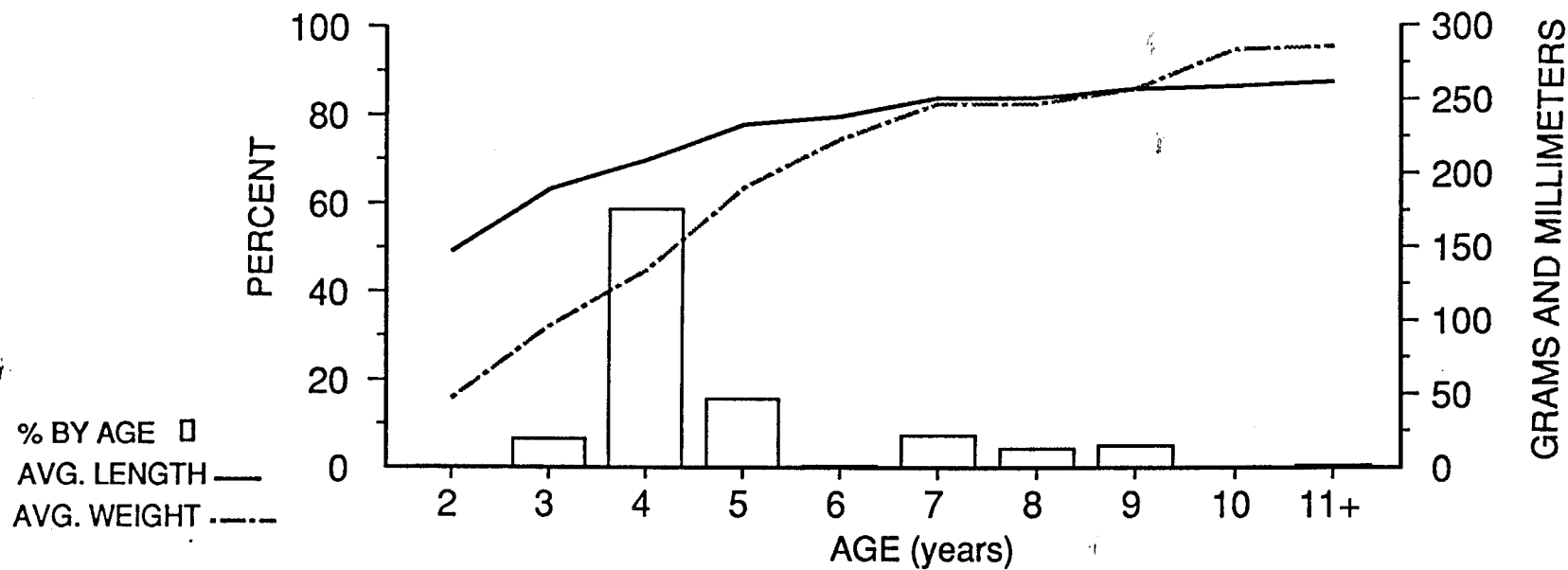
STOCK NAME	GEAR TYPE	HARVEST DATE	LENGTH-AT-AGE										TOTAL AVG.	N
			2	3	4	5	6	7	8	9	10	11+		
Raspberry Straits	1	5/1-5/15	165	184	201	228	-	254	248	250	-	-	202	457
Malina Bay	1	4/18	-	183	203	227	229	240	-	265	245	-	207	170
Paramanof Bay	1	4/17	-	184	202	218	238	247	251	-	264	255	206	181
Perenos Bay	1	4/23	-	188	204	224	230	241	238	-	-	-	207	136
Long Tonki Bay	1	5/20	-	191	205	219	256	-	244	-	-	-	207	103
Izhut Bay	1	4/19-4/20	-	-	211	234	-	253	253	269	-	264	221	111
Danger Bay	1	4/20-4/24	-	200	216	242	-	262	258	270	-	251	228	147
Litnik Bay	1	5/14	-	-	209	240	-	252	251	-	262	289	245	48
Kupreanof Straits	1	5/20	-	195	214	230	234	242	244	253	-	-	231	117
Viekoda Bay	1	5/2	-	185	202	207	-	-	-	-	-	-	201	100
Terror Bay	1	4/21	-	187	203	219	240	-	-	-	-	-	202	178
Village Island	1	4/24	-	195	214	238	246	236	248	259	-	-	228	150
N.E. Arm Uganik	1	4/30-5/22	-	194	208	228	-	264	246	254	265	268	223	175
E. Arm Uganik	1	4/25	-	192	208	227	226	242	-	-	-	-	211	197
S. Arm Uganik	1	4/26-4/28	-	188	202	220	-	-	246	-	-	-	201	376
Inner Uyak Bay	1	5/3-5/7	140	190	215	232	223	248	250	253	256	242	229	223
Spiridon Bay	1	4/28-5/3	-	194	210	235	-	243	254	257	267	-	230	144
Zachar Bay	1	5/2	-	187	203	217	-	243	244	-	-	257	203	129
Deadman Bay	1	5/11	-	189	215	227	-	254	-	-	-	-	216	135
Sulua Bay	1	5/13	165	187	210	230	243	230	-	-	-	-	214	167
Olga Bay	1	5/24-6/9	142	196	219	229	237	238	244	252	234	248	223	302
Amee Bay	1	4/17-4/18	-	223	228	243	254	257	260	260	266	268	245	251
Barling Bay	1	4/19	-	-	234	244	225	260	259	263	-	265	245	130
Outer Kiliuda Bay	1	5/1	-	212	234	246	-	255	270	266	267	-	247	54
Inner Kiliuda Bay	1	4/27-4/29	-	-	222	239	-	250	252	261	264	-	240	100
Shearwater Bay	1	4/30	-	-	230	242	-	253	254	262	-	-	241	88
Outer Ugak Bay	1	4/24	-	237	233	240	247	251	247	258	-	-	246	69
Ugak Bay	1	4/27	-	-	229	240	249	253	249	255	-	-	249	100
Middle Bay	1	4/20	-	-	219	240	250	250	248	-	-	262	237	66
Women's Bay	1	5/10	-	-	220	249	255	259	256	269	-	-	255	48
Sheratin Bay	1	5/20	-	179	216	243	245	251	260	260	250	-	237	66
Kizhuyak Bay	1	4/20-4/27	-	194	212	231	241	253	252	272	265	-	216	217
Kashvik Bay	1	5/10-5/23	-	186	212	225	231	243	252	255	263	263	220	235
Alinchak Bay	1	5/19	-	188	209	224	-	245	237	-	-	258	210	83
Wide Bay	1	5/18	-	185	215	229	237	-	251	-	-	267	221	95

Table 7. Summary of average weight by age by bay of Kodiak herring sac-roe stocks, 1988.

STOCK NAME	GEAR TYPE	HARVEST DATE	2	3	4	AVERAGE WEIGHT BY AGE							TOTAL AVG.	N
						5	6	7	8	9	10	11+		
Raspberry Straits	1	5/1-5/15	64	84	105	180	-	265	-	-	-	-	105	182
Malina Bay	1	4/18	-	-	-	-	-	NO WEIGHTS		-	-	-	-	-
Paramanof Bay	1	4/17	-	69	113	104	-	218	231	-	290	-	130	48
Perenosa Bay	34	4/23	-	83	154	178	234	238	242	272	-	-	199	107
Long Tonki Bay	1	5/20	-	100	130	176	294	-	216	-	-	-	138	55
Izhut Bay	1	4/19-4/20	-	-	141	196	-	242	254	306	-	337	166	109
Danger Bay	1	4/20-4/24	-	-	-	-	-	NO WEIGHTS		-	-	-	-	-
Litnik Bay	1	5/14	-	-	140	212	-	250	245	-	290	357	230	47
Kupreanof Straits	1	5/20	-	96	146	187	203	238	228	255	-	-	192	110
Viekoda Bay	1	5/2	-	80	110	95	-	-	-	-	-	-	107	60
Terror Bay	1	4/21	-	94	121	109	194	-	-	-	-	-	121	59
Village Island	1	4/24	-	140	131	184	220	176	213	257	-	-	163	90
N.E. Arm Uganik	1	4/30-5/22	-	124	136	182	-	252	240	251	304	298	186	75
E. Arm Uganik	1	4/25	-	93	120	158	141	209	-	-	-	-	125	117
S. Arm Uganik	1	4/26-4/28	-	90	119	160	-	-	220	-	-	-	118	181
Inner Uyak Bay	1	5/3-5/7	-	75	126	170	-	239	214	240	-	193	171	57
Spiridon Bay	1	4/28-5/3	-	124	134	188	-	197	249	239	278	-	182	135
Zachar Bay	1	5/2	-	-	-	-	-	NO WEIGHTS		-	-	-	-	-
Deadman Bay	1	5/11	-	95	147	170	-	232	-	-	-	-	153	60
Sulua Bay	1	5/13	47	87	133	179	268	177	-	-	-	-	146	136
Olga Bay	1	5/24-6/9	30	92	135	162	226	208	251	278	-	-	159	72
Amee Bay	1	4/17-4/18	-	172	178	206	246	264	280	274	293	294	226	125
Barling Bay	1	4/19	-	-	177	217	150	315	297	325	-	-	222	38
Outer Kiliuda Bay	1	5/1	-	108	170	214	-	250	257	279	295	-	217	50
Inner Kiliuda Bay	1	4/27-4/29	-	-	167	206	-	254	254	283	282	-	218	96
Shearwater Bay	1	4/30	-	-	176	213	-	263	253	259	-	-	211	88
Outer Ugak Bay	1	4/24	-	201	212	212	270	257	256	282	-	-	239	68
Ugak Bay	1	4/27	-	-	180	222	290	250	255	255	-	-	241	90
Middle Bay	1	4/20	-	-	150	187	193	220	228	-	-	219	195	66
Women's Bay	1	5/10	-	-	146	217	246	264	250	289	-	-	247	46
Sheratin Bay	1	5/20	-	94	152	209	227	243	291	256	230	-	204	66
Kizhuyak Bay	1	4/20-4/27	-	90	138	175	195	135	235	293	259	-	146	140
Kashvik Bay	1	5/10-5/23	-	95	131	158	-	230	224	266	282	272	146	61
Alinchak Bay	1	5/19	-	103	142	180	-	234	231	-	-	279	145	83
Wide Bay	1	5/18	-	81	134	182	184	-	219	-	-	305	156	48

Table 8. Herring sac-rope fishery A-W-L summary for the Kodiak Management Area, 1988.

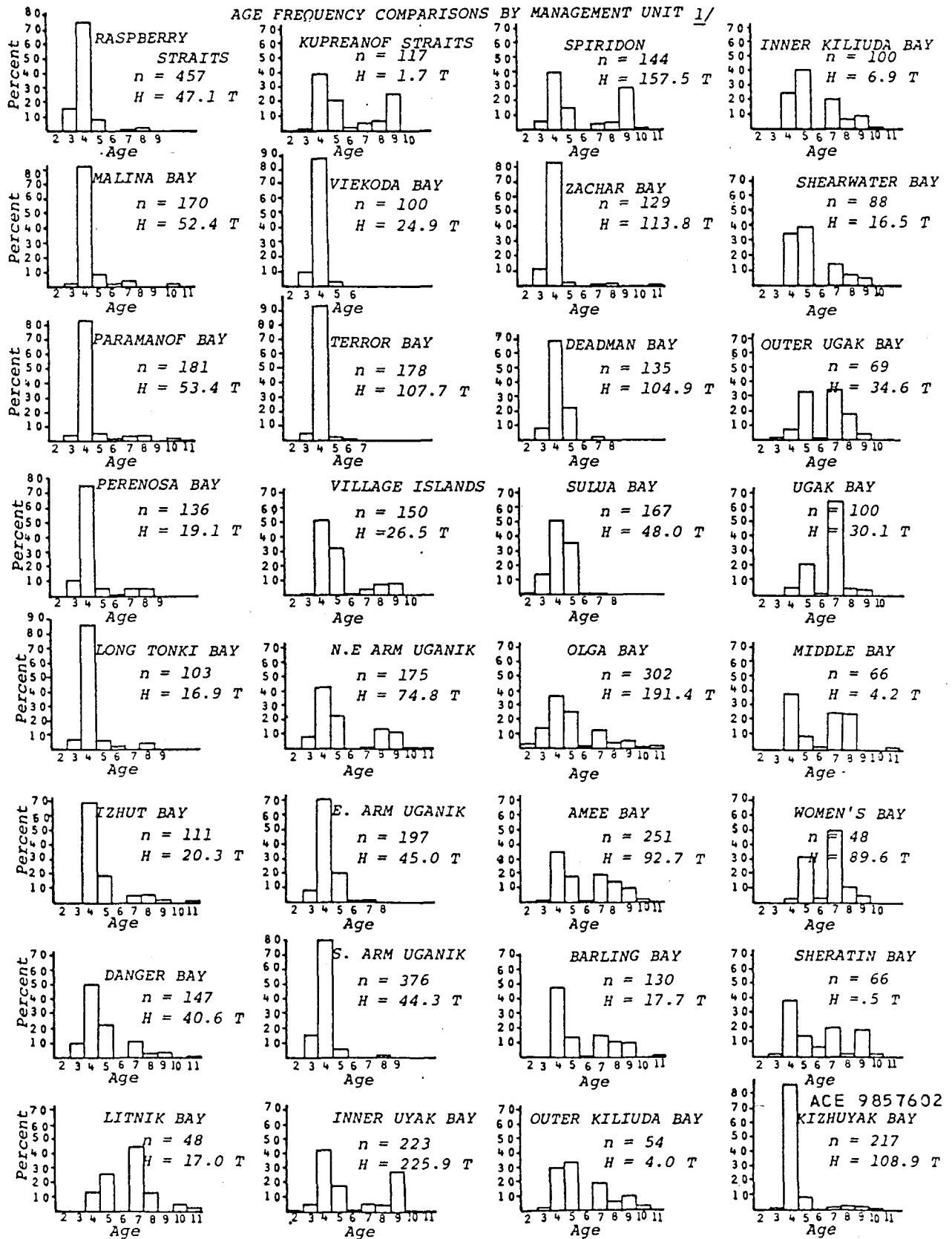
	AGE										
	2	3	4	5	6	7	8	9	10	11+	TOTAL/±
N	9	358	3139	841	34	397	234	271	26	39	5348
% BY AGE	.2	6.7	58.7	15.7	.6	7.4	4.4	5.1	.5	.7	100%
N	9	358	3139	841	34	397	234	271	26	39	5348
AVG. LENGTH (mm)	147	189	209	233	238	251	251	257	259	262	220
N	3	148	1450	499	23	288	167	160	15	12	2765
AVG. WEIGHT (GMS)	47	96	134	190	223	247	247	257	284	286	170



1988

KODIAK AREA HERRING SAC ROE FISHERY

AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT 1/



1/ All samples collected from commercial seine catches unless otherwise noted.

Figure 2. Kodiak Area herring-sac-ro-e fishery age frequency comparisons by management unit, 1988.

1988  
KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT 1/

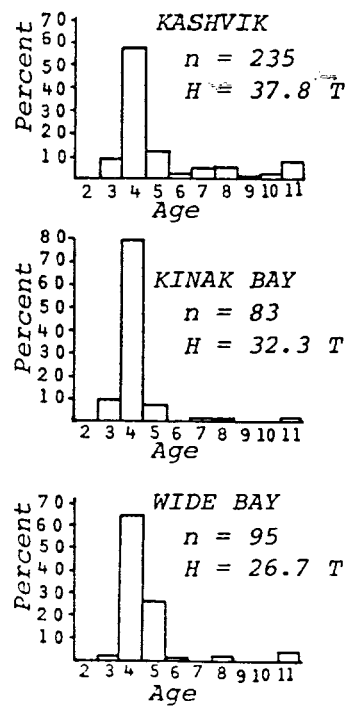
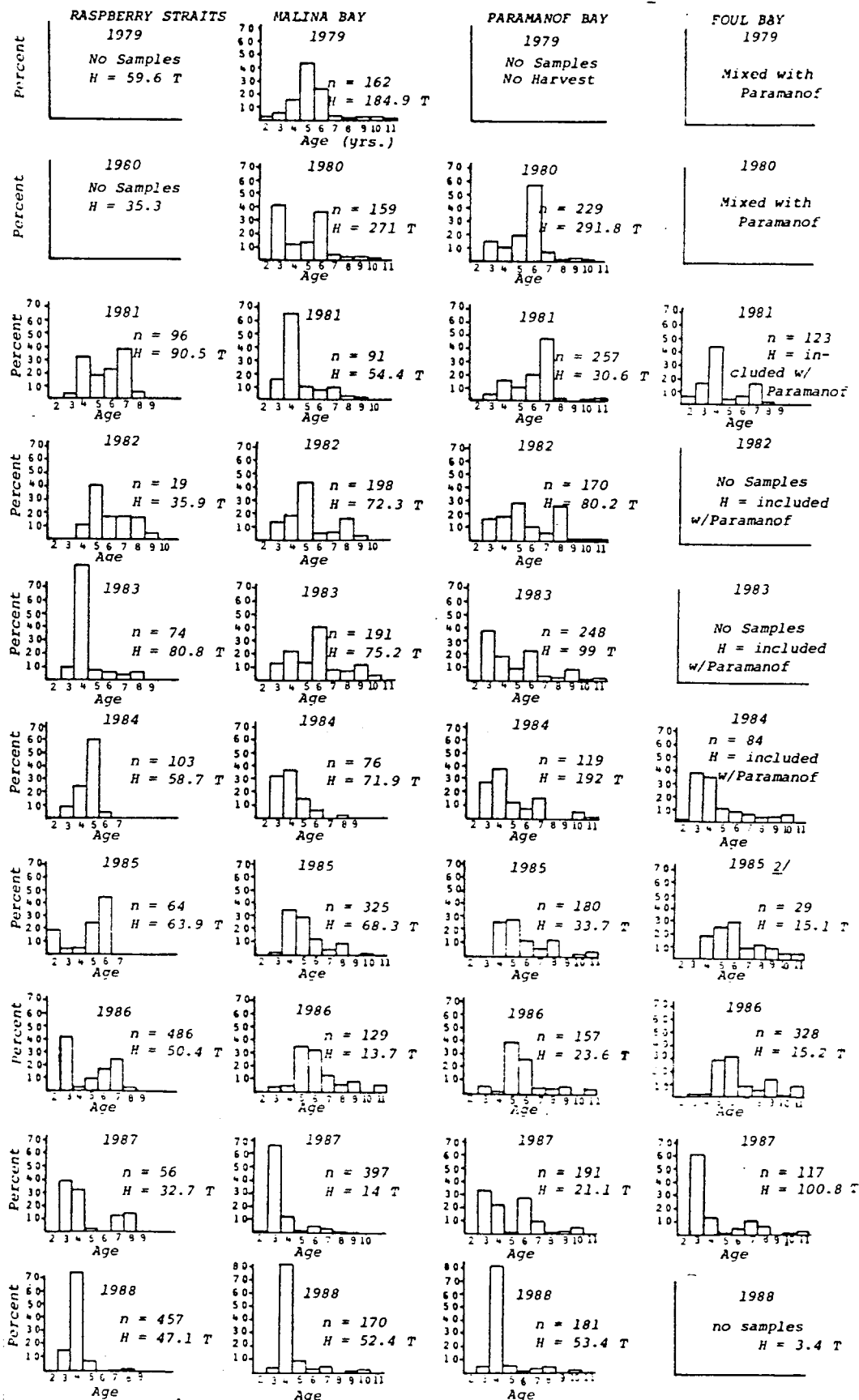


Figure 2. (page 2 of 2)

KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR 1/

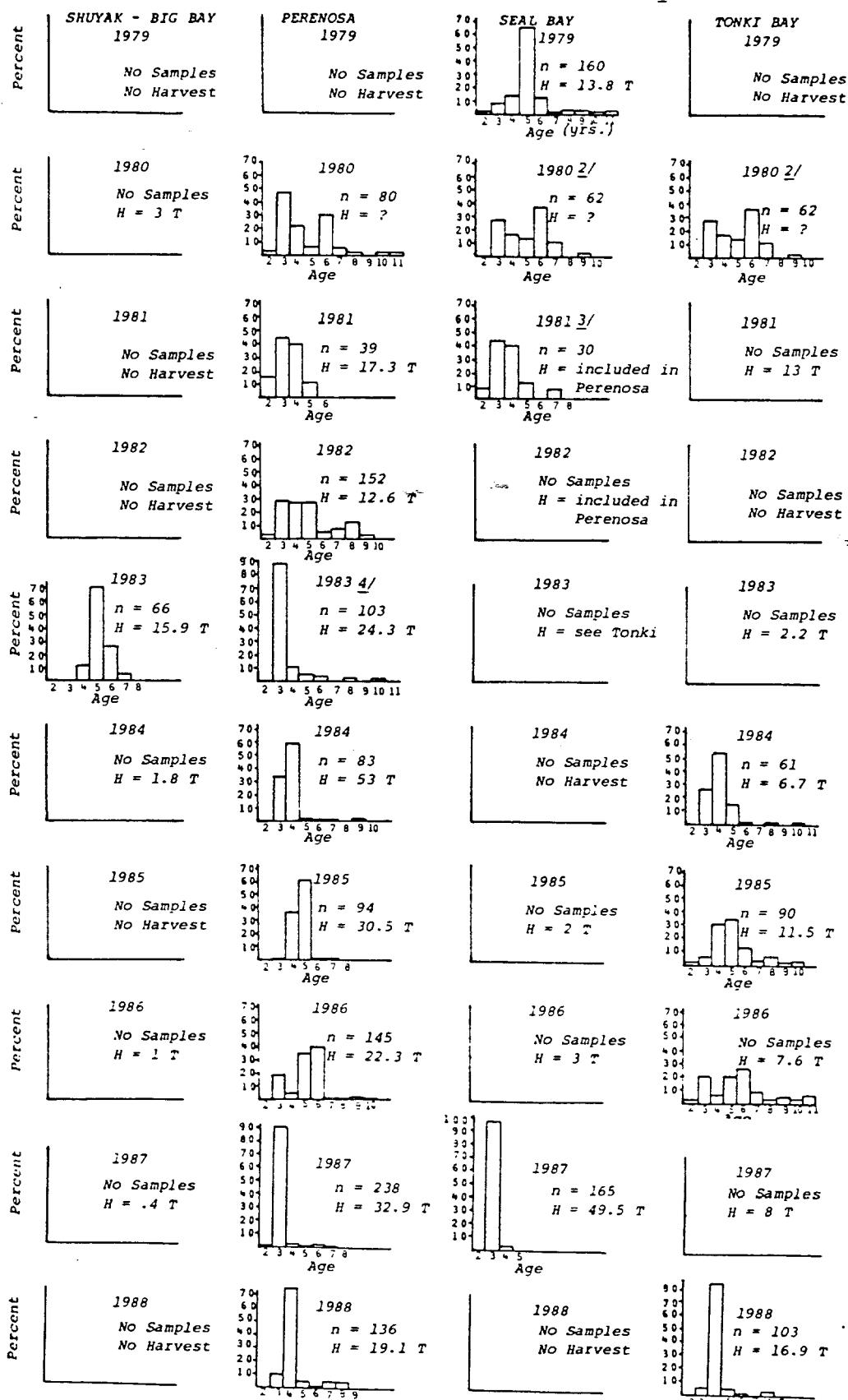


1/ All samples collected from commercial seine catches unless otherwise noted.

2/ Commercial gillnet sample.

Figure 3. Kodiak Area herring sac-roë fishery age frequency comparisons by management unit by year, 1979-1988.

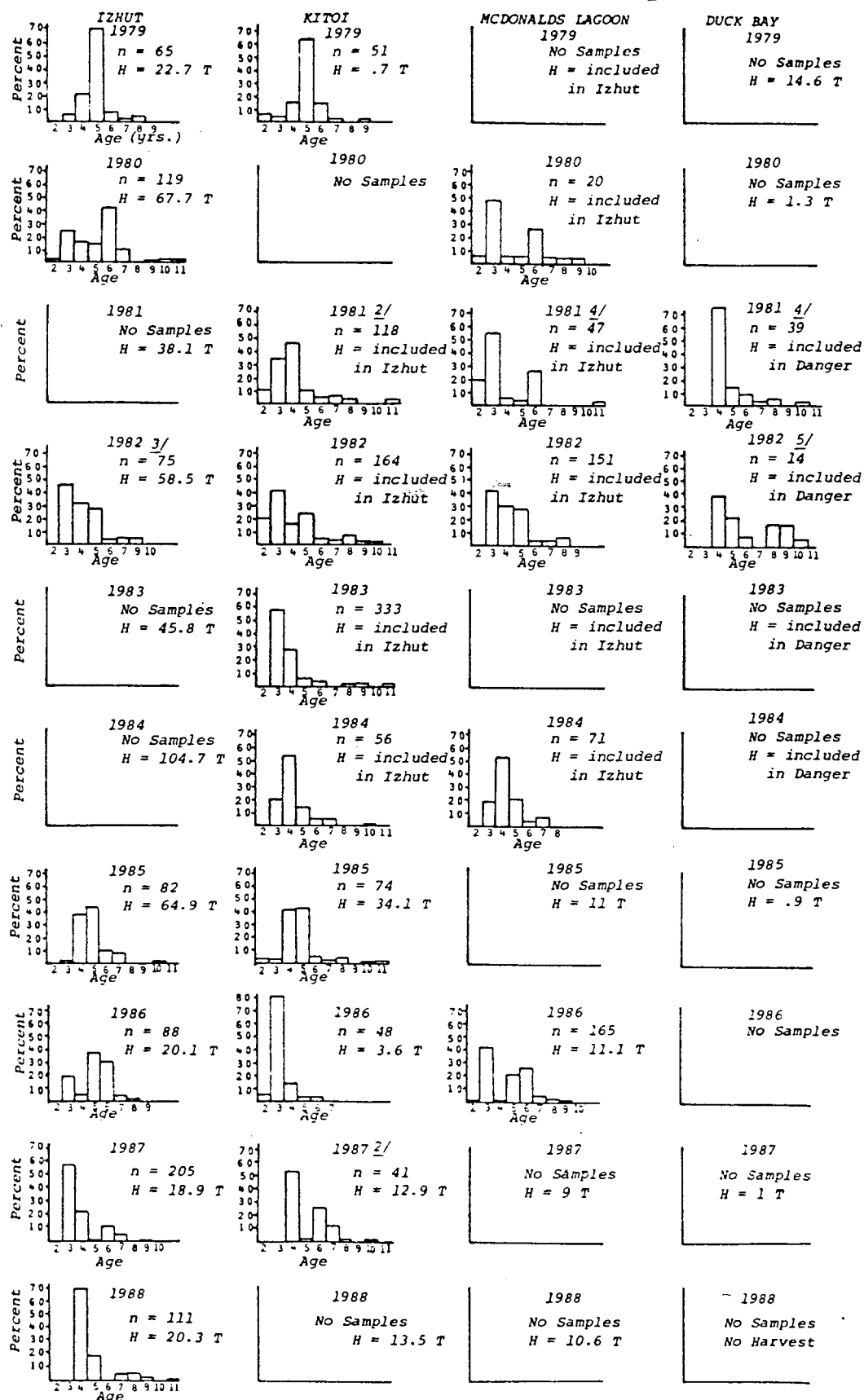
KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR <sup>1/</sup>



<sup>1/</sup>All samples collected from commercial seine catches unless otherwise noted. Age  
<sup>2/</sup>Mixed Sample, Perenosa/Seal/Tonki. <sup>3/</sup>Phoenix Bay. <sup>4/</sup>Mixed Sample, Red Fox Bay/  
Discoverer Bay

Figure 3. (page 2 of 11)

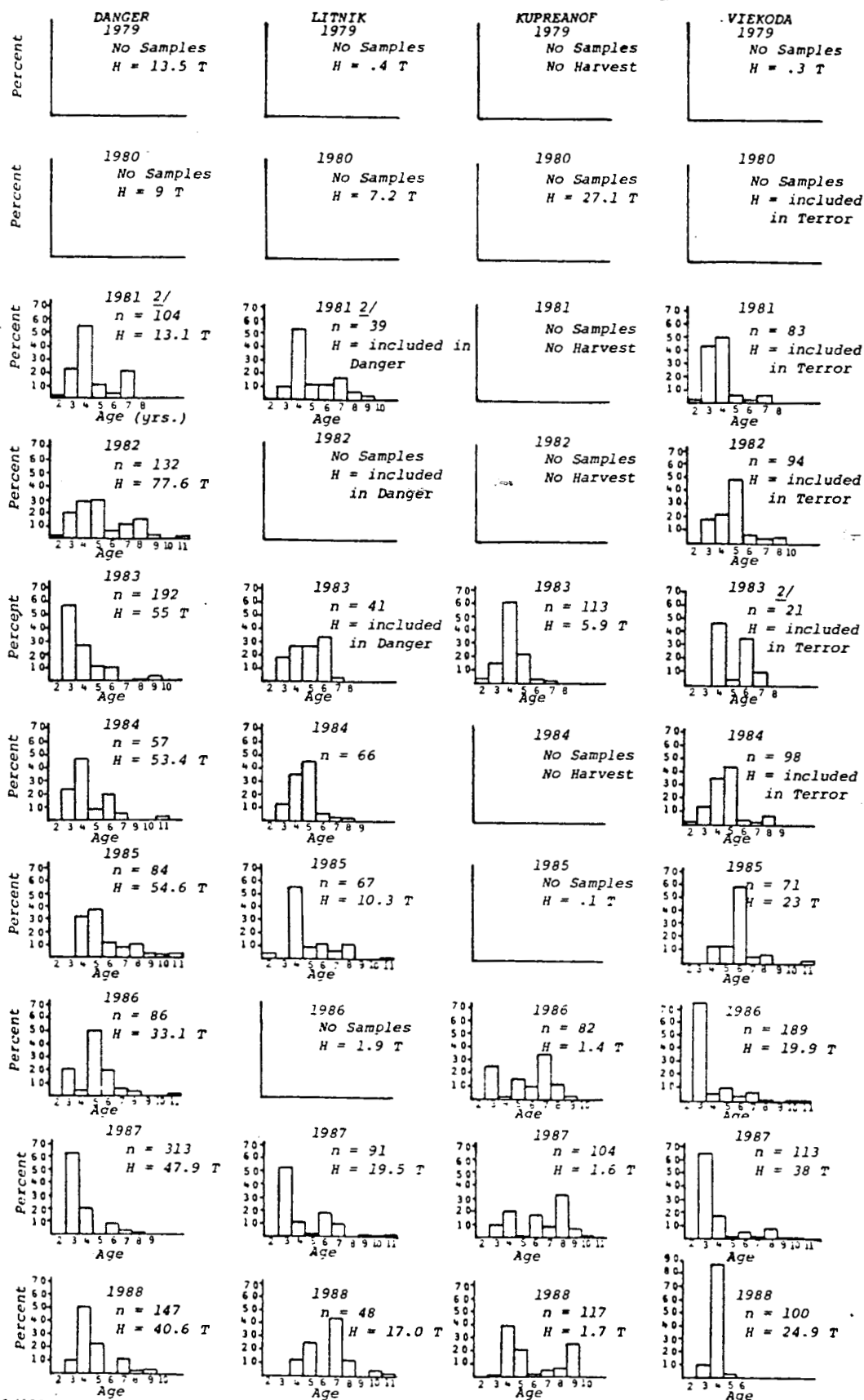
KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR 1/



1/All samples collected from commercial seine catches unless otherwise noted.  
2/F&G gillnet samples. 3/Mixed McDonald's Lagoon/Ruth Bay. 4/Commercial gillnet sample. 5/September bait herring fishery.

Figure 3. (page 3 of 11)

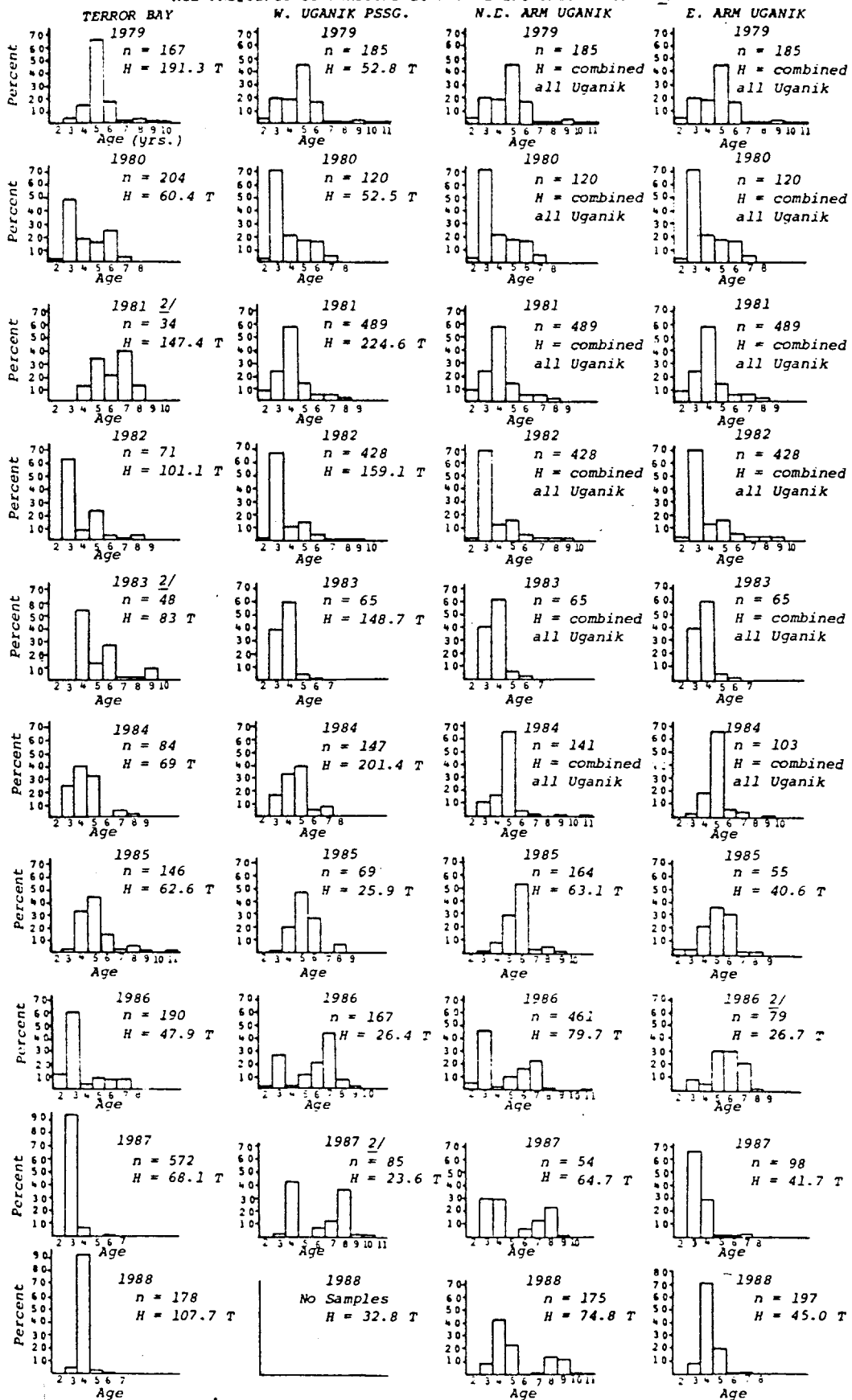
KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR 1/



1/All samples commercial seine caught unless otherwise noted. 2/Commercial gillnet caught.

Figure 3. (page 4 of 11)

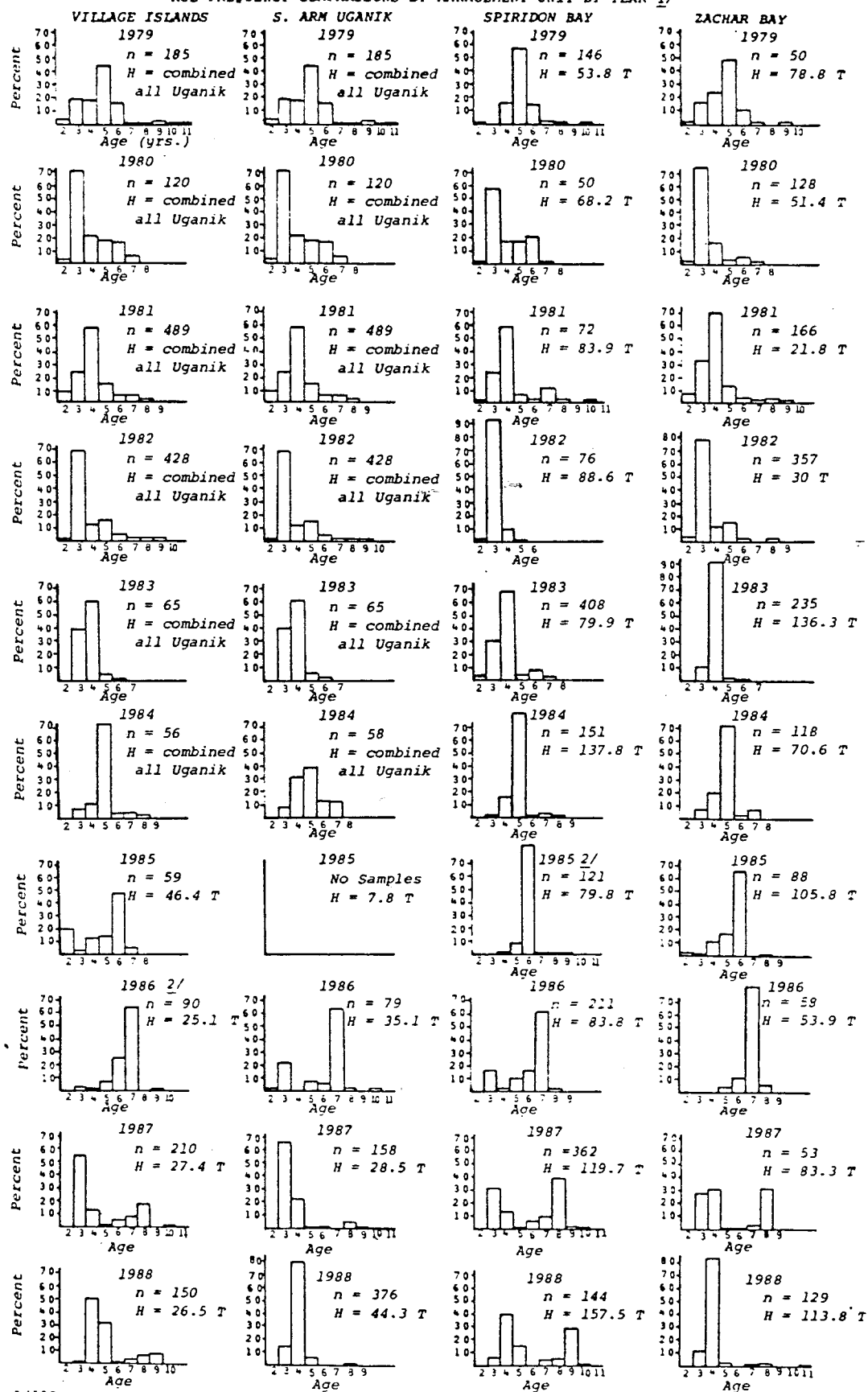
KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR <sup>1/</sup>



<sup>1/</sup>All samples commercial seine caught unless otherwise noted.  
<sup>2/</sup>Commercial gillnet sample.

Figure 3. (page 5 of 11)

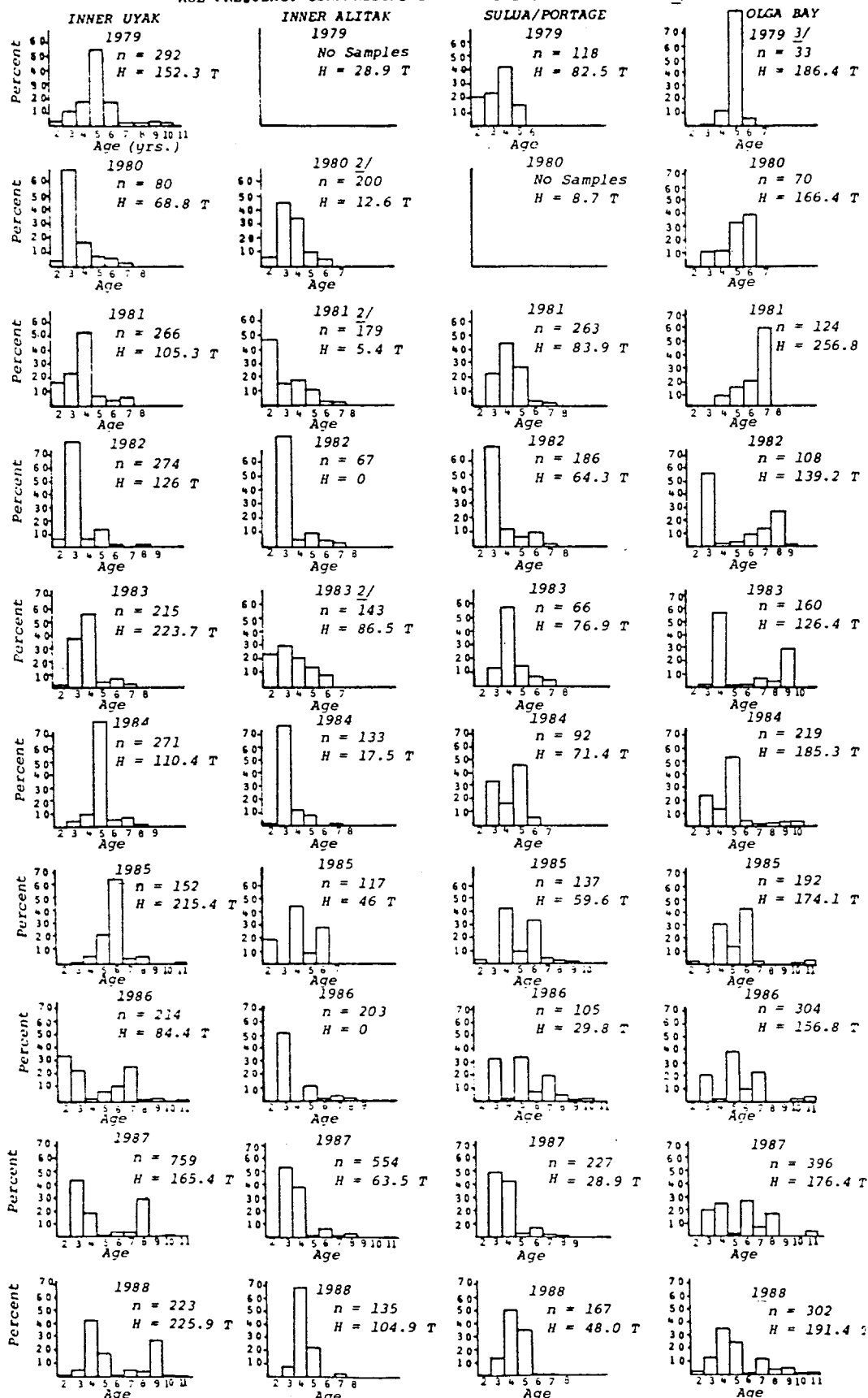
KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR 1/



1/All samples commercial seine caught unless otherwise noted.  
2/Commercial gillnet sample.

Figure 3. (page 6 of 11)

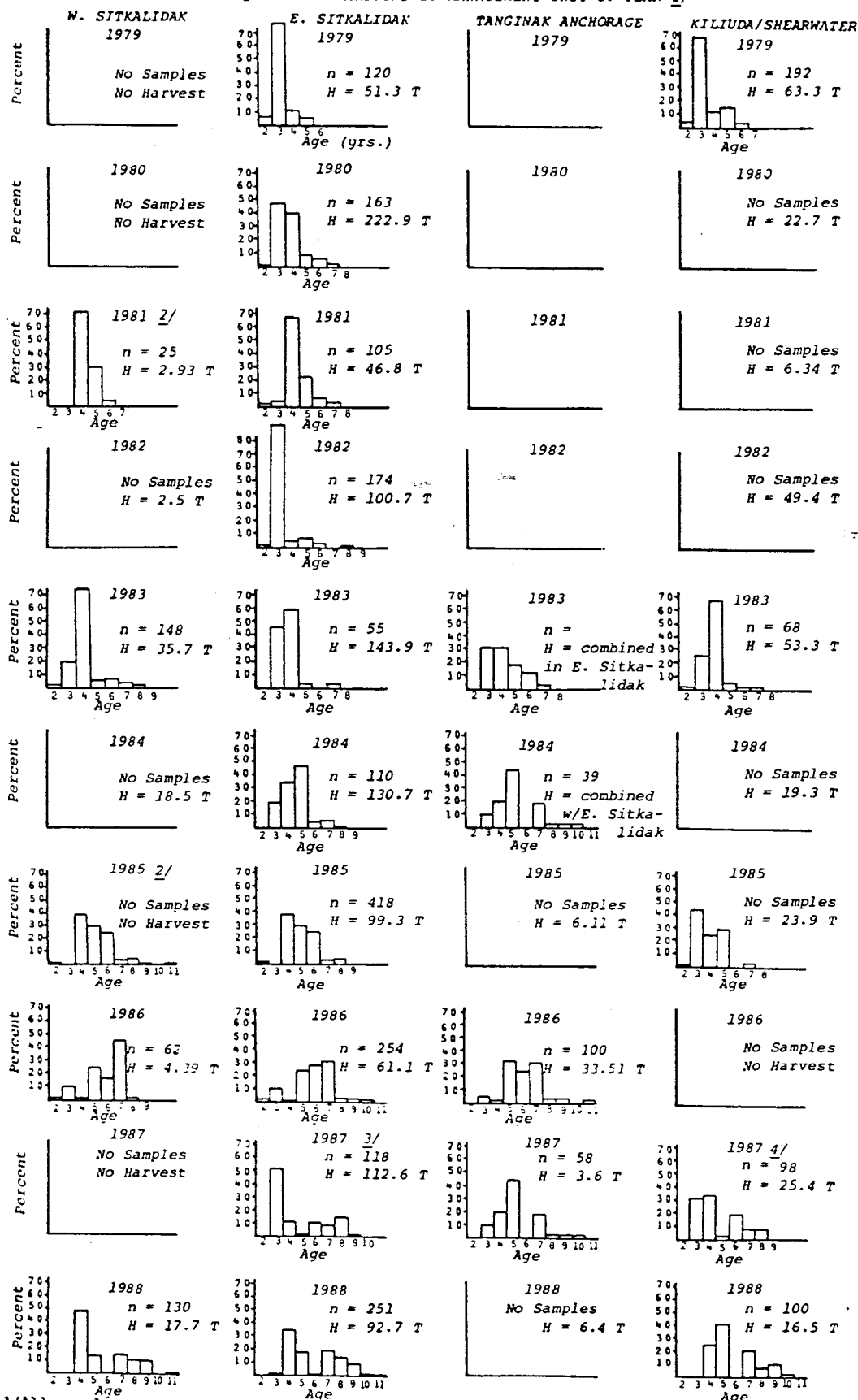
KODIAK AREA HEPRINO SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR 1/



1/All samples commercial seine caught unless otherwise noted. 2/Shrimp trawl sample.  
3/F&G gillnet sample.

Figure 3. (page 7 of 11)

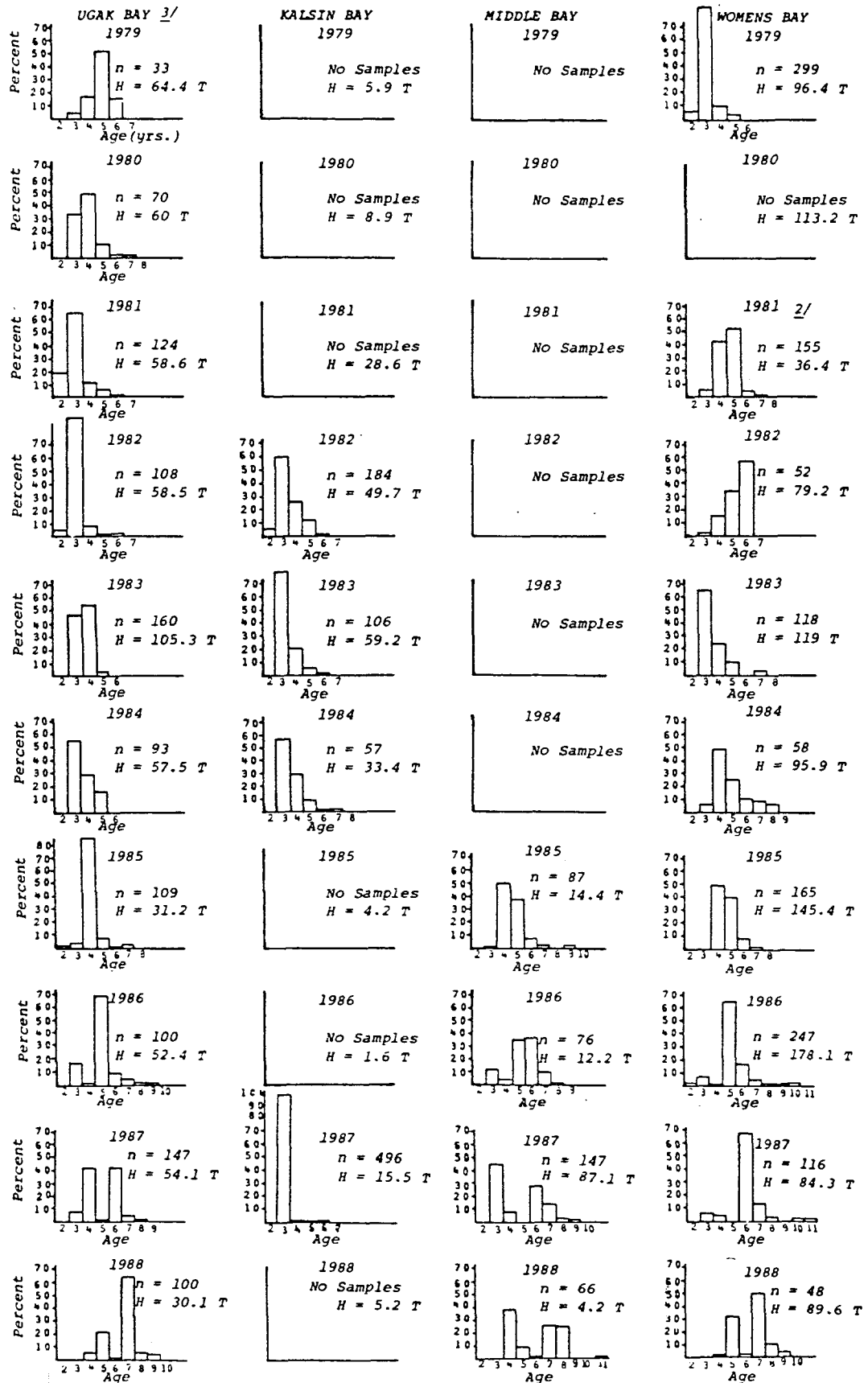
KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR <sup>1/</sup>



<sup>1/</sup>All samples commercial seine caught unless otherwise noted. <sup>2/</sup>Commercial gillnet sample. <sup>3/</sup>Barling Bay, previous samples Amee Bay or Amee/Barling combined. Harvest figure combines both bays. <sup>4/</sup>Kiliuda Bay sample. Harvest includes Kiliuda and Shearwater Bays.

Figure 3. (page 8 of 11)

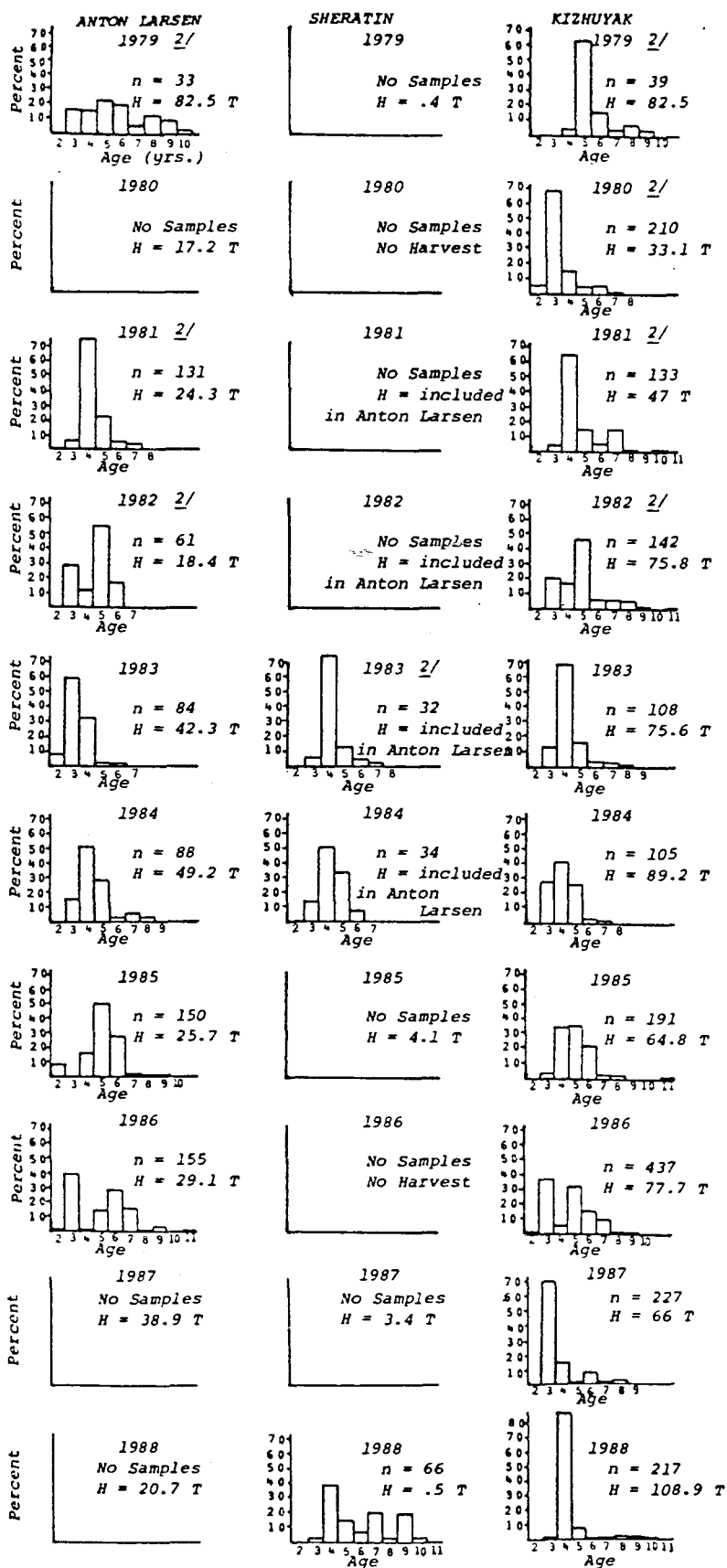
KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR 1/



1/All samples commercial seine caught unless otherwise noted. 2/Commercial gillnet sample. 3/F&G gillnet sample.

Figure 3. (page 9 of 11)

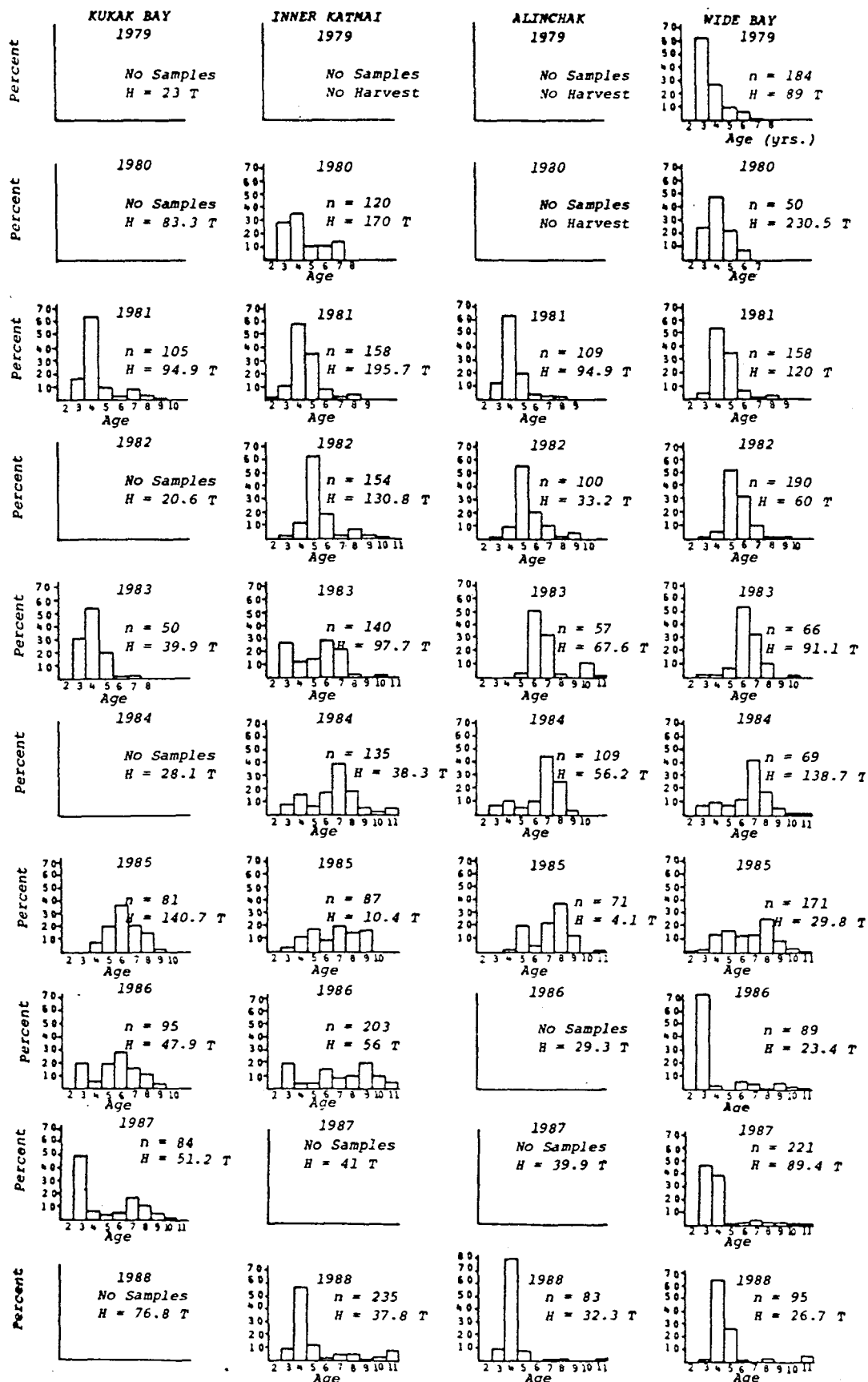
KODIAK AREA HERRING SAC ROE FISHERY  
AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR 1/



1/All samples commercial seine caught unless otherwise noted.  
2/Commercial gillnet sample.

Figure 3. (page 10 of 11)

**KODIAK AREA HERRING SAC ROE FISHERY**  
**AGE FREQUENCY COMPARISONS BY MANAGEMENT UNIT BY YEAR 1/**



1/ All samples from commercial seine catches unless otherwise noted

Figure 3. (page 11 of 11)

Table 9. Commercial herring fisheries historical harvest levels for the Kodiak Management Area, 1912-1988.

YEAR	FOOD & BAIT	SAC ROE	TOTAL	YEAR	FOOD & BAIT	SAC ROE	TOTAL	YEAR	FOOD & BAIT	SAC ROE	TOTAL
1912	20.0	0.0	20.0	1940	22677.0	0.0	22677.0	1968	15.4	2001.0	2016.4
1913	0.0	0.0	0.0	1941	40083.5	0.0	40083.5	1969	11.0	1130.0	1141.0
1914	0.0	0.0	0.0	1942	16791.0	0.0	16791.0	1970	7.5	342.0	349.5
1915	0.0	0.0	0.0	1943	35352.0	0.0	35352.0	1971	44.2	284.0	328.2
1916	70.0	0.0	70.0	1944	26835.0	0.0	26835.0	1972	49.8	215.0	264.8
1917	137.9	0.0	137.9	1945	31114.0	0.0	31114.0	1973	178.0	831.0	1009.0
1918	118.4	0.0	118.4	1946	47505.9	0.0	47505.9	1974	40.1	868.0	908.1
1919	259.7	0.0	259.7	1947	50743.0	0.0	50743.0	1975	5.2	8.0	13.2
1920	45.9	0.0	45.9	1948	46428.0	0.0	46428.0	1976	N/A	5.0	5.0
1921	944.9	0.0	944.9	1949	0.0	0.0	0.0	1977	N/A	338.0	338.0
1922	1482.6	0.0	1482.6	1950	44132.5	0.0	44132.5	1978	398.9	904.0	1302.9
1923	321.5	0.0	321.5	1951	4299.0	0.0	4299.0	1979	124.8	1736.0	1860.8
1924	4823.0	0.0	4823.0	1952	1389.0	0.0	1389.0	1980	380.7	2384.0	2764.7
1925	9997.0	0.0	9997.0	1953	725.0	0.0	725.0	1981	18.0	2063.0	2081.0
1926	2680.9	0.0	2680.9	1954	0.0	0.0	0.0	1982	326.0	1771.0	2097.0
1927	2592.9	0.0	2592.9	1955	0.0	0.0	0.0	1983	33.4	2319.0	2352.4
1928	625.0	0.0	625.0	1956	13524.0	0.0	13524.0	1984	123.0	2163.0	2286.0
1929	NO DATA	0.0	0.0	1957	21218.5	0.0	21218.5	1985	102.0	1968.0	2070.0
1930	622.0	0.0	622.0	1958	1711.0	0.0	1711.0	1986	213.0	1558.0	1771.0
1931	1000.0	0.0	1000.0	1959	3831.0	0.0	3831.0	1987	217.1	2146.0	2363.1
1932	3594.0	0.0	3594.0	1960	0.0	0.0	0.0	1988	340.2	2171.0	2511.2
1933	2312.5	0.0	2312.5	1961	0.0	0.0	0.0	1989	N/A	2229.1	2229.1
1934	60000.0	0.0	60000.0	1962	0.0	0.0	0.0				
1935	NO DATA	0.0	0.0	1963	0.0	0.0	0.0				
1936	24748.0	0.0	24748.0	1964	309.8	568.0	877.8				
1937	27659.3	0.0	27659.3	1965	35.0	657.0	692.0				
1938	24522.0	0.0	24522.0	1966	198.0	2769.0	2967.0				
1939	38600.5	0.0	38600.5	1967	300.3	1662.0	1962.3				

# KODIAK MANAGEMENT AREA HERRING FOOD/BAIT FISHERY STATISTICAL CHART

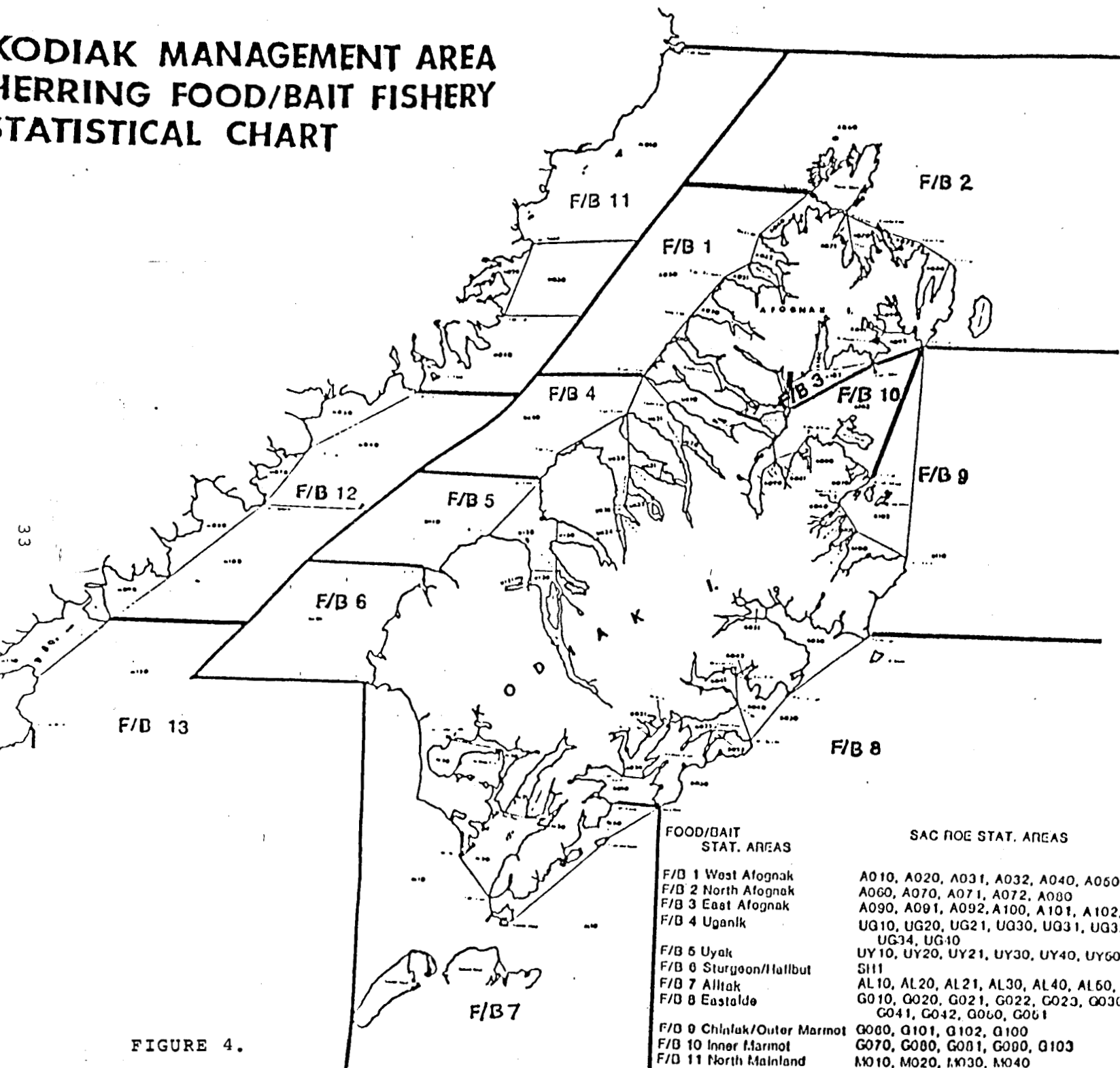


FIGURE 4.

## KODIAK HERRING FOOD/BAIT FISHERY

### *Historical Perspective*

#### General

Historically the Kodiak food/bait fishery was one of the State's major fisheries. It was primarily a reduction fishery during its peak production years and yielded tonnages which dwarf current food/bait production. During a seventeen year period (1934-1950) an average harvest of approximately 35,000 tons was sustained (Table 9). The primary product was fish meal, which required the relatively large quantities of fish which apparently were available, and the secondary use was salted food and bait products. The current fishery is primarily a bait fishery, providing a frozen product for local longline and crab fleets. Various attempts have been made at developing food products but success has been marginal, for whatever reason.

Historical effort involved large "sardine-seiner" type vessels, used in conjunction with "holding pounds" for the reduction fishery and the local small vessel seine fleet, and to a lesser extent gillnets, for a portion of the food fishery.

#### Fishery Characteristics

The current Kodiak Area herring food/bait fishery can be characterized as being a secondary commercial fishery on herring concentrations located in Kodiak waters (Figure 4). Effort and yield levels are at historical lows for the food/bait fishery whereas the sac-roë fishery supports near record levels of effort and yield. The food/bait fishery is an open-to-entry fishery, while the sac-roë fishery has been limited-to-entry since 1981. Existing regulations designate priority status to the sac-roë fishery, in that regulatory harvest strategy allocates a very major percentage of the allowable harvest on local stocks to the sac-roë fishery.

The herring food/bait season by regulation extends from August 1 through February 28. The entire area is open to continuous fishing on August 1 for all legal gear, namely seines, gillnets and trawls. There are no exclusive gear areas and the only gear restrictions are for maximum seine and gillnet length, 100 fathoms and 150 fathoms, respectively. All gear is required to register at the Kodiak ADF&G office prior to fishing, and at that time management plans are issued and catch-reporting procedures and current regulations are reviewed. Each landing is sampled and extensive skipper interviews are conducted to evaluate which sac-roë stocks are being impacted.

For local Kodiak stocks which are exploited during the sac-roe fishery, the food/bait herring G.H.L. on those same stocks is generally 10% of the previous season's sac-roe harvest.

There are major concentrations of non-local stocks which over-winter in East Shelikof Straits adjacent to Westside Kodiak and Afognak Islands. In 1986 a stock identification study using scale pattern analysis was performed on the above mentioned non-local stocks. The study concluded that at least 80% of the East Shelikof herring were of Kamishak spawning stock origin. Taking into account the type of stock separation study and the large biomass which was sampled, there is a high probability the remaining percentage is also of Kamishak origin.

In March 1987, the Board allocated two percent of the previous season's total available spawning biomass from Kamishak for harvesting during Kodiak's food/bait herring fishery.

### Harvest Strategy

The attached (Appendix A.2) 1988/89 Kodiak Food/Bait Fishery Management Plan describes the current harvest strategy in detail.

The targeted food and bait fishery on Kamishak spawning stocks over-wintering in Shelikof Straits is limited to harvesting two percent of the previous season's total available spawning biomass in Kamishak.

In order to make the actual harvest tonnage reflect only those fish which comprise the spawning biomass the following adjustments were made:

All food/bait herring landings from the targeted fishery on Kamishak stocks in Shelikof Straits were sampled. All age 3 and younger herring were converted to age 5 herring by weight by landing. This was done in an attempt to relate the actual food/bait harvest on Kamishak stocks to the G.H.L. allocation which is based on spawning biomass only and not juveniles. Age 3 herring were selected because in the Kamishak spawning stocks, herring generally are not considered to be part of the spawning biomass until they reach age 4 with complete recruitment into the spawning biomass by age 5.

### *1988/89 Season Summary*

#### Harvest and Effort

During the 1988/89 food/bait season which ran from August 1 through February 28, a total of 340.21 tons of herring were harvested. Four buyer/processors participated in this fishery. In addition, nine vessels and one tender registered to participate in this

fishery, four with trawl gear, two with seine gear and three with gillnet gear. The estimated ex-vessel value of this fishery was \$136,084. A majority (99%) of the harvest was taken by trawl gear.

### The Fishery

Herring were harvested between mid-August and mid-January with the majority of this year's harvest occurring in December and January. With the exception of two small deliveries totaling approximately 2 tons, all deliveries were sampled for age-weight-length (AWL) data. (See Table 10.)

Only one emergency order was issued, closing the South and East Arm Sections of Uganik Bay effective 7:00 P.M. November 11, 1988.

Of the 340.1 tons harvested, 13.24 tons are considered to be local Kodiak spawning stocks. The remaining 329.97 tons harvested are considered to be non-local stocks which spawn in Kamishak Bay based on AWL summaries, which are most similar to Kamishak spawning stocks, the extensive biomass which has been the source of these harvests, and the geographic location where the harvests have occurred.

All of this year's harvest was sold for use as bait. Oil content from one delivery sampled in mid-November was approximately 18%. The adjusted harvest total on Kamishak stocks, converting all age 3 and younger to age 5 by weight is 378.81 tons. (See Table 10.)

### *1989/90 Management Plans and Issues*

Depending on effort levels in the 1989/90 fishery, additional check-in, check-out requirements may be necessary to be included in the reporting requirements.

Additional funding may be necessary to cover in-season A.W.L. sampling and vessel time for "on the grounds" monitoring of the Shelikof fishery.

The ADF&G vessel, M/V Resolution, will be used, when available, to provide acoustical biomass estimates of the Kamishak spawning stocks which over-winter in Shelikof Straits.

Table 10. Kodiak commercial food/bait herring AWL summaries, 1988-89.

Sample Period	Age (years)	Sex			Percent of Total	Total	Weight			Std. Length			Tons	Adj. Tons
		Male	Female	Unknown			Mean (gm)	Std. Dev.	Number Weighed	Mean (mm)	Std. Dev.	Number Measured		
UGANIK BAY DISTRICT														
11/11	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	-	-	-	-	-	-	-	-	-	-	-
	2	2	1	-	3	3.1	87	6.9	3	180	1.0	3	.16	.36
	3	2	2	-	4	4.1	127	10.2	4	208	13.0	4	.32	.49
	4	16	18	-	34	35.1	154	21.8	34	221	9.2	34	3.29	3.29
	5	11	14	-	25	25.8	194	29.4	25	236	10.5	25	3.04	3.04
	6	2	-	-	2	2.1	207	.0	2	241	1.4	2	.26	.26
	7	2	-	-	2	2.1	186	11.3	2	245	7.8	2	.23	.23
	8	2	8	-	10	10.3	228	35.2	10	247	11.1	10	1.42	1.42
	9	4	12	-	16	16.5	244	28.9	16	252	8.3	16	2.44	2.44
	10	-	-	-	-	-	-	-	-	-	-	-	-	-
11+	-	1	-	1	1.0	360	-	1	265	-	1	.23	.23	
Period total		41	56	-	97	100.0	188	50.2	97	232	18.6	97	11.39	11.76
OUTER WEST AFOGNAK STATISTICAL AREA A050														
12/12	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	1	1	-	2	1.4	47	-	1	150	11.3	2	.05	.20
	2	1	1	-	2	1.4	-	-	-	185	14.1	2	-	-
	3	2	2	-	4	2.8	136	18.5	3	210	8.3	4	.28	.40
	4	17	11	-	28	19.3	166	19.6	18	226	11.7	28	2.34	2.34
	5	24	17	-	41	28.3	197	31.7	20	238	8.2	41	4.08	4.08
	6	6	4	-	10	6.9	231	20.9	7	248	9.8	10	1.17	1.17
	7	10	5	-	15	10.3	242	28.9	8	249	6.1	15	1.83	1.83
	8	12	6	-	18	12.4	272	35.8	8	255	7.9	18	2.48	2.48
	9	9	-	-	9	6.2	289	38.8	5	259	6.6	9	1.32	1.32
	10	3	2	-	5	3.4	270	41.0	2	253	8.2	5	.68	.68
11+	8	3	-	11	7.6	293	28.4	4	263	10.4	11	1.63	1.63	
Period total		93	52	-	145	100.0	214	56.8	76	241	20.1	145	15.85	16.12

-Continued-

Table 10. (page 2 of 5)

Sample Period	Age (years)	Sex			Total	Percent of Total	Weight			Std. Length			Tons	Adj. Tons
		Male	Female	Unknown			Mean (gm)	Std. Dev.	Number Weighed	Mean (mm)	Std. Dev.	Number Measured		
12/16	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	3	3	1.6	34	.0	2	142	2.1	3	.22	1.25
	2	10	2	-	12	6.3	89	11.4	6	189	6.3	12	2.32	4.98
	3	7	10	-	17	9.0	122	3.4	4	208	8.4	17	4.50	7.06
	4	28	35	-	63	33.3	152	24.7	35	223	10.4	63	20.77	20.77
	5	16	34	-	50	26.5	191	18.1	25	237	9.4	50	20.76	20.76
	6	4	3	-	7	3.7	191	17.5	4	246	10.1	7	2.91	2.91
	7	3	3	-	6	3.2	230	7.6	4	250	6.2	6	3.00	3.00
	8	5	5	-	10	5.3	237	5.7	2	261	8.4	10	5.14	5.14
	9	7	3	-	10	5.3	277	46.4	3	258	7.8	10	6.01	6.01
	10	1	2	-	3	1.6	309	-	1	260	12.9	3	2.01	2.01
	11+	6	2	-	8	4.2	289	17.0	3	270	9.3	8	5.02	5.02
Period total		87	99	3	189	100.0	173	54.8	89	230	24.1	189	72.67	78.91
12/17	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	3	3	2.4	36	10.1	3	147	12.6	3	.05	.26
	2	7	4	1	12	9.4	73	12.2	6	180	8.2	12	.40	1.02
	3	7	9	1	17	13.4	110	27.6	10	199	12.8	17	.86	1.45
	4	16	19	-	35	27.6	143	21.1	22	217	9.4	35	2.30	2.30
	5	20	10	-	30	23.6	185	20.2	11	233	6.7	30	2.56	2.56
	6	4	-	-	4	3.1	-	-	-	232	7.7	4	-	-
	7	6	5	-	11	8.7	237	34.7	6	246	8.8	11	1.20	1.20
	8	3	4	-	7	5.5	237	13.1	4	250	8.6	7	.76	.76
	9	3	1	-	4	3.1	275	8.7	4	264	6.6	4	.51	.51
	10	2	-	-	2	1.6	281	-	1	255	1.4	2	.26	.26
	11+	2	-	-	2	1.6	-	-	-	256	2.8	2	-	-
Period total		70	52	5	127	100.0	158	65.7	67	221	25.8	127	8.90	10.32

-Continued-

Table 10. (page 3 of 5)

Sample Period	Age (years)	Sex			Total	Percent of Total	Weight			Std. Length			Tons	Adj. Tons
		Male	Female	Unknown			Mean (gm)	Std. Dev.	Number Weighed	Mean (mm)	Std. Dev.	Number Measured		
12/18	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	-	1	4	5	3.5	37	16.9	5	144	15.1	5	.49	2.35
	2	6	6	1	13	9.2	78	8.7	11	180	6.2	13	2.68	6.10
	3	5	3	-	8	5.6	103	24.0	5	203	16.7	8	2.20	3.75
	4	22	23	-	45	31.7	154	24.7	20	218	9.8	45	18.45	18.45
	5	18	22	-	40	28.2	176	31.3	20	230	12.5	40	18.77	18.77
	6	1	1	-	2	1.4	185	4.9	2	236	2.1	2	.98	.98
	7	7	2	-	9	6.3	209	2.6	3	246	8.7	9	5.00	5.00
	8	5	1	-	6	4.2	252	-	1	252	5.0	6	4.02	4.02
	9	2	3	-	5	3.5	220	13.9	3	252	13.6	5	2.93	2.93
	10	2	2	-	4	2.8	235	21.2	2	257	9.1	4	2.50	2.50
	11+	3	2	-	5	3.5	273	13.3	3	259	9.5	5	3.63	3.63
Period total		71	66	5	142	100.0	151	61.5	75	222	26.9	142	61.65	68.47
12/21	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	1	1	13	15	7.7	35	8.0	15	142	8.9	15	.77	3.68
	2	23	11	3	37	19.1	74	14.9	37	174	11.9	37	3.99	9.08
	3	14	16	-	30	15.5	114	23.9	30	198	13.0	30	4.96	7.36
	4	40	15	-	55	28.4	144	25.2	55	212	10.3	55	11.57	11.57
	5	20	18	-	38	19.6	168	27.0	38	223	12.1	38	9.33	9.33
	6	1	1	-	2	1.0	211	.0	2	237	.7	2	.61	.61
	7	1	6	-	7	3.6	228	21.6	7	244	8.5	7	2.33	2.33
	8	-	1	-	1	.5	279	-	1	252	-	1	.41	.41
	9	3	3	-	6	3.1	242	34.3	6	250	8.4	6	2.12	2.12
	10	-	1	-	1	.5	214	-	1	238	-	1	.31	.31
	11+	-	2	-	2	1.0	290	13.4	2	260	2.1	2	.84	.84
Period total		103	75	16	194	100.0	132	58.4	194	203	29.4	194	37.23	47.64
12/29	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	3	-	2	5	3.4	26	4.7	5	134	9.8	5	.16	1.10
	2	7	11	-	18	12.1	76	16.1	18	178	10.9	18	1.72	3.98
	3	10	4	-	14	9.4	117	18.3	14	200	9.7	14	2.04	3.09

-Continued-

Table 10. (page 4 of 5)

Sample Period	Age (years)	Sex			Percent of		Weight			Std. Length			Tons	Adj. Tons
		Male	Female	Unknown	Total	Total	Mean (gm)	Std. Dev.	Number Weighed	Mean (mm)	Std. Dev.	Number Measured		
	4	22	23	-	45	30.2	152	20.9	45	217	8.5	45	8.52	8.52
	5	26	24	-	50	33.6	177	21.5	50	229	8.5	50	11.05	11.05
	6	1	2	-	3	2.0	224	17.9	3	244	9.0	3	.84	.84
	7	1	5	-	6	4.0	228	32.4	6	242	9.7	6	1.70	1.70
	8	-	1	-	1	.7	309	-	1	266	-	1	.39	.39
	9	3	3	-	6	4.0	240	28.7	6	253	4.7	6	1.80	1.80
	10	-	-	-	-	-	-	-	-	-	-	-	-	-
	11+	1	-	-	1	.7	294	-	1	263	-	1	.37	.37
Period total		74	73	2	149	100.0	154	54.0	149	215	26.4	149	28.58	32.83
1/5	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	6	6	2.9	28	2.9	6	139	4.1	6	.35	2.31
	2	8	12	-	20	9.5	81	12.3	13	180	8.8	20	3.34	7.71
	3	12	12	-	24	11.4	108	24.5	17	199	11.0	24	5.36	9.25
	4	38	38	-	76	36.2	143	22.1	57	214	9.9	76	22.55	22.55
	5	28	26	-	54	25.7	186	19.0	44	230	7.5	54	20.81	20.81
	6	-	2	-	2	1.0	190	7.8	2	233	.7	2	.78	.78
	7	4	3	-	7	3.3	257	22.4	3	244	8.2	7	3.73	3.73
	8	3	5	-	8	3.8	241	21.6	7	246	7.0	8	4.00	4.00
	9	3	2	-	5	2.4	259	22.9	3	250	7.4	5	2.68	2.68
	10	2	-	-	2	1.0	234	12.7	2	251	4.9	2	.97	.97
	11+	2	4	-	6	2.9	300	17.8	6	261	5.4	6	3.73	3.73
Period total		100	104	6	210	100.0	158	60.0	160	216	24.7	210	68.30	78.52
1/9	0	-	-	-	-	-	-	-	-	-	-	-	-	-
	1	-	-	2	2	1.4	32	2.8	2	148	3.5	2	.04	.21
	2	7	16	-	23	15.8	79	20.3	23	184	11.7	23	1.00	2.37
	3	6	8	-	14	9.6	109	24.1	14	200	13.0	14	.84	1.45
	4	14	14	-	28	19.2	148	23.2	28	220	10.1	28	2.29	2.29
	5	26	24	-	50	34.2	186	22.5	50	235	8.0	50	5.16	5.16
	6	1	4	-	5	3.4	211	17.7	4	243	14.1	5	.58	.58
	7	6	-	-	6	4.1	220	23.8	6	243	6.2	6	.73	.73

-Continued-

Table 10. (page 5 of 5)

Sample Period	Age (years)	Sex			Percent of Total		Weight			Std. Length			Tons	Adj. Tons
		Male	Female	Unknown	Total	Total	Mean (gm)	Std. Dev.	Number Weighed	Mean (mm)	Std. Dev.	Number Measured		
	8	3	2	-	5	3.4	241	19.9	5	252	9.3	5	.67	.67
	9	2	1	-	3	2.1	244	18.1	3	251	8.4	3	.41	.41
	10	2	-	-	2	1.4	245	7.8	2	261	21.2	2	.27	.27
	11+	3	5	-	8	5.5	272	17.2	8	261	5.5	8	1.20	1.20
Period total		70	74	2	146	100.0	163	60.3	145	223	26.1	146	13.20	15.34
1/10	0	-	-	1	1	.3	21	-	1	125	-	1	.01	.10
	1	4	2	39	45	13.9	30	4.8	44	138	7.2	45	.76	4.43
	2	48	41	3	92	28.5	81	23.3	83	182	10.0	92	4.23	9.05
	3	21	19	-	40	12.4	107	19.3	36	201	9.0	40	2.44	3.94
	4	48	39	-	87	26.9	135	26.0	71	214	11.3	87	6.72	6.72
	5	19	19	-	38	11.8	172	28.2	28	230	13.7	38	3.74	3.74
	6	1	-	-	1	.3	-	-	-	228	-	1	-	-
	7	4	2	-	6	1.9	225	12.5	3	246	7.2	6	.77	.77
	8	1	1	-	2	.6	236	-	1	249	9.2	2	.27	.27
	9	2	4	-	6	1.9	265	72.1	6	262	13.1	6	.91	.91
	10	-	-	-	-	-	-	-	-	-	-	-	-	-
	11+	1	4	-	5	1.5	259	2.1	3	258	2.9	5	.74	.74
Period total		149	131	43	323	100.0	107	58.4	276	197	33.0	323	20.59	30.66

## APPENDICES

1988 "  
HERRING SAC-ROE HARVEST STRATEGY  
KODIAK MANAGEMENT AREA

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Regional Information Report<sup>1</sup> No. 4K-88-18

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Division of Commercial Fisheries  
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<sup>1</sup>The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.

## TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION.....	1
GENERAL HARVEST POLICY.....	1

### REGULATORY ABSTRACT

Regulations in Effect.....	2
Registration Requirements.....	2
Guideline Harvest Levels.....	3
Fishing Season.....	3
Fishing Periods.....	4
Closed Areas.....	4
Extra Time for Gillnetters.....	4
Airplanes.....	5
Legal Gear.....	5

### IN-SEASON STRATEGY DISCUSSION

General Discussion.....	5
Fishing Periods.....	7
E.O. Announcements.....	7
ADF&G Field Crews/Fisherman Cooperation.....	8
In-Season Catch Reporting.....	8
Guideline Harvest Levels.....	9

### TABLES AND FIGURES

Table 1. Guideline Harvest Levels by Management Units.....	10
Table 2. Industry Effort/Harvest Summary 1979-1987.....	14
Table 3. Limited Entry Permit Status - January 1988.....	15
Table 4. Kodiak Herring Management Staff.....	16
Figure 1. Kodiak Area Herring Statistical Chart.....	17

1988  
KODIAK AREA HERRING SAC-ROE FISHERY

INTRODUCTION

The Kodiak Area herring sac-roë fishery has occurred annually since 1964, a 24 year period. This fishery was an open-to-entry fishery from 1964 to 1980, and was under a moratorium-to-new-entry fishery from 1981 to 1984, and has been a limited entry fishery from 1985 to present. Effort levels during these years are shown in Table 2. A listing of entry permits issued by gear type as of January 1988 is shown in Table 3.

This fishery targets on individual herring stocks during their spawning period. The desired product is pre-spawn herring having a roe recovery percentage acceptable to industry. In recent years the average roe recovery has approximated 10% in this fishery.

During this 24 year period the average harvest has been 1,280 tons. For the nine (9) year period from 1979-1987, when both seine and gillnet gear levels have evolved through similar regulatory adjustments, the average harvest has been 2,000 tons. The annual harvest levels during this nine year period have oscillated closely around this average harvest (Table 2).

GENERAL HARVEST POLICY

Harvesting is intended to occur in an orderly fashion with minimal waste of the resource and within conservation limits as determined by the Alaska Department of Fish and Game (ADF&G). Consequently, ADF&G will manage the fishery per the statewide general herring policy which provides for harvesting to occur in traditional in-shore areas and at the traditional time of greatest roe recovery value, so much as possible. However, roe recovery will not be a criteria for emergency openings or closures except in cases where documented excessive wastage is, or is expected to be, a factor.

Because of the differential timing and abundance of Kodiak's various exploited herring stocks, relatively high ratio of gear levels to Guideline Harvest Levels (GHL's), and the competition between gear types for the same stocks, this fishery is best served by a fixed opening date, which is currently April 15. The season will close for each stock by emergency order as their respective guideline harvest levels are achieved or when fishery performance and stock performance indicate that deviations from the guideline harvest levels are warranted, i.e. where actual harvests should occur at levels greater or lesser than expected. Stocks which are considered to be under-exploited in-season will remain open until the regulatory closure of June 30. During the regulatory season, April 15 to June 30, stocks which have been closed to harvesting may be reopened if it is determined by ADF&G that "new" fish have increased the available spawning biomass to the point that the initial exploitation rate has dropped below 10% for that stock (See Table 1.) Any reopenings will require confirmation that the "new" fish are not juvenile herring, post spawners, or other forage fish and will require that ADF&G have the ability to monitor and regulate the reopening "on the grounds". At least 24 hours notice will be given prior to any reopenings.

#### REGULATORY ABSTRACT

##### REGULATIONS IN EFFECT:

THERE HAVE BEEN NO CHANGES IN THE KODIAK AREA COMMERCIAL HERRING REGULATIONS FOR THE 1988 SEASON. All herring regulation changes adopted by the Board of Fisheries in March 1988 will not be in effect until July 1, 1988. All of the Kodiak herring regulations listed in the 1987 regulation book will be in effect for the 1988 season; all of the Kodiak herring regulations listed in the 1988 regulation book will be identical to the 1987 Kodiak herring regulations.

##### REGISTRATION REQUIREMENTS:

##### TENDERS AND PROCESSORS

The tender registration procedure requires:

- Each tender operator and processor must register either in person or may be registered by an authorized agent for the tender or processor.
- Registration must occur prior to taking fish on-board the tender or taking fish at the processing plant.

Registration will ensure that all tenders and processors know the proper reporting requirements needed by ADF&G to manage the herring sac-roë fishery.

THIS REGULATION WILL BE STRICTLY ENFORCED FOR THE 1988 SEASON!

- (See Regulation 5 AAC 27.540 of the Commercial Herring Regulations.

FISHING VESSELS

There is no registration requirement for either seine or gillnet vessels.

GUIDELINE HARVEST LEVELS:

For the 1988 sac-roë season, approximately 2,065 short tons are expected to be harvested from the entire management area. Harvest projections by management unit are listed in Table 1.

These harvest projections are the best estimates of what harvest levels should be expected from each stock based upon ADF&G evaluation of stock health. These harvest projections are not guaranteed quotas and the actual harvest may exceed or fall short of these projections.

FISHING SEASON

April 15 through June 30 unless closed earlier by emergency order on a stock by stock basis.

Stock closures may result from desired harvest levels either being achieved or else in jeopardy of being significantly exceeded. Stock closures may also result when unexpected weaknesses in stock strength become apparent.

#### FISHING PERIODS

Initially, fishing periods will be 24 hours long. They will begin at 12:00 Noon on all odd numbered days and end at 12:00 Noon on all even numbered days during the months of April and May. The first 24 hour fishing period will begin at 12:00 Noon on April 15.

#### CLOSED AREAS:

##### Regulatory Closures

Women's Bay is closed inside of a line from Shannon's Point to Nyman's Peninsula. The latitudes and longitudes of these points are described in regulation 5 AAC 27.530.

##### 1988 Emergency Order Closures:

All Uganik Island Lagoons will remain closed until it can be determined that specific and adequate spawning biomasses are available for harvest.

Lower Olga Bay/Moser Bay Section will remain closed until it can be determined that specific and adequate spawning biomass is available for harvest and that the GHL cannot easily be obtained from the Upper Olga Bay Section.

Brown's Lagoon will remain closed from it's entrance. There will be no 500 yard closure off it's mouth.

#### EXTRA TIME FOR GILLNETTERS

Under certain conditions, herring gillnetters are allowed a two hour grace period before having to completely remove their gear from the water. These conditions are:

1. Herring gillnets may remain in the water up to two hours after the announced "primary closure time" for those announced fishing periods having three hours of less fishing time.
2. Herring gillnets may remain in the water up to two hours after the announced "primary" closure time for those fishing periods

greater than three hours in length, where the announcement occurs less than three hours before the scheduled "primary closure time" of the fishing period.

The "primary closure time" is the time at which all seine gear must have completed fishing. When it applies, the "secondary closure time", i.e. at the end of the two hour grace period for gillnet gear, ALL GILLNETS MUST BE COMPLETELY OUT OF THE WATER AND NO GILLNET GEAR MAY BE SET OR RESET AFTER THE "PRIMARY CLOSING TIME".

#### AIRPLANES:

There are no restrictions on the use of airplanes in the roe herring fishery.

#### LEGAL GEAR:

See regulations 5 AAC 27.515, 27.520, and 27.525 on pages 28 and 29 of the 1987 Commercial Herring Fishing Regulation Book.

### IN-SEASON STRATEGY

#### General Discussion

As shown in Table 1, those sections where historical harvests have occurred have been assigned guideline harvest levels. Those sections where sporadic or no harvests have occurred have been designated "Exploratory" with no designated guideline harvest level, however in-season closures will be used to ensure that excessive harvests are minimized in exploratory situations.

The guideline harvest levels established for each section, district and/or the entire management area are meant to reflect the stock status. This means that the previous season's stock performance has been evaluated and that trends have been identified and used to influence the current season's GHL's. Specifically, these criteria are 1) 1987 expected biomass vs. actual biomass estimates, 2) average school size, 3) trends in age composition, 4) level of recruitment (age 3), 5) proportion of the spawning population age

5 and younger, 6) level of age 2 fish in the spawning biomass (indicator of future recruit strength) and 7) spawn observations (extent, frequency, amount deposited). This information is supplemented by fishery performance information, namely the expected vs. actual harvest timing, harvest duration and harvest level.

Guideline harvest level adjustments are subsequently made based upon the aforementioned criteria. Adjustments may vary from 0 to  $\pm 100\%$  of the previous season's GHL depending upon the degree remedial action is required, generally however adjustments are gradual,  $\pm 25\%$  or  $\pm 50\%$ . For the 1988 season a few stocks were adjusted as much as  $+75\%$  and some  $+50\%$ . Several stocks were adjusted  $+25\%$  and many remained at the 1987 level (particularly smaller stocks). A few were also adjusted  $-25\%$ ; there were no downward adjustments greater than  $-25\%$ .

At any time in-season, closed area adjustments can be made when it appears that pre-season expectations were wrong. Consequently there may be sections either closed prior to reaching their GHL's or allowed to harvest in excess of their GHL's either in one opening or reopenings if the assessed available spawning biomass warrants it.

#### Fishing Periods

Initially fishing periods will begin at 12:00 Noon on the odd numbered days of the month beginning on April 15 and end at 12:00 Noon on the even numbered days. Staggered days of fishing have the advantage of an automatic cut off date that allows the staff time to collect and summarize all catch data and compare reported catches with actual harvest. In every sac-roë herring season since 1979 excessive harvest has been prevented in some areas by pre-established fishing periods. Towards the end of the season (usually early June) when fleet size and exploited stocks are few in number, fishing periods may be modified to provide more

continuous fishing time to facilitate adequately harvesting late occurring stocks. However, ADF&G's ability to monitor this fishery becomes very limited by late May and June and this will be a major consideration in the nature of fishing period modifications.

During the months of April and May, the primary harvest period, more restrictive adjustments in fishing periods are not expected to occur. However, in the event that active gear levels expand to the point that a pattern of excessive harvests develop, deviations from the normal 24 hour fishing periods may be required.

E.O. Announcements: "Getting the Word"

Because the management strategy for this fishery allows for all gear to fish all open areas during the open fishing periods, there is considerable dispersion of gear throughout the season. Consequently, it is very important for the fleet to keep abreast of any changes in closures, potential short notice closures, and/or reopenings. This can be accomplished in the following ways: 1) By personal contact with the Kodiak Herring Management staff in Kodiak via office visits, telephone (either at work or at home), or radio-telephone; 2) By contact with ADF&G field personnel and the ADF&G vessel, the M/V COHO; 3) By contacting Peggy Dyson on 4125 mhs or any local herring processor and having them transmit the latest Kodiak herring emergency order; 4) By calling the 24-hour recorded message phone at 486-4559; 5) By listening for any emergency order update which will be broadcast by Peggy Dyson following either her 8:00 A.M. or 6:00 P.M. weather broadcasts; 6) By reading or collecting the latest emergency order from the pouch posted outside the entrance to the Kodiak Fish and Game building; and 7) By listening to the Fish and Game reports broadcast over the local AM and FM radio stations (consult stations for broadcast times). No announcements will be given via VHF because of the limited broadcast range from the Kodiak office; however special consideration may be given to the Chiniak Bay fishery if the VHF base station is operational for the 1988 season.

Because of the extensive announcements associated with this fishery, it is highly recommended that fishermen document the latest E.O. announcement broadcast from Peggy Dyson by either marking a chart or making a tape recording of her broadcast. Many fishermen currently do this as do the ADF&G and F&W protection vessels.

#### ADF&G Field Crews/Fishermen Cooperation:

The crew on board the Department's M/V COHO and seasonal biologists in remote tent camps will aid the Area Management Biologists by making frequent fishermen contacts to collect data on harvest levels and rates, fleet movements, and fleet observations of herring concentrations. Fishermen cooperation will be appreciated when Department personnel request herring samples from the commercial catch. These samples will be used primarily for monitoring age composition, which assists in determining the health of the stock when used with other stock performance indicators. Copies of historical age data by stock are readily available at the Kodiak ADF&G office.

ADF&G field crews will also be monitoring and mapping spawning activities, and all will be soliciting information on commercial sightings to supplement information gathered by ADF&G. Fishermen and spotter pilots are encouraged to provide biomass and spawning information to ADF&G; these reports will be treated confidentially. Past cooperation has generally been excellent and has proven valuable in evaluating stock status and in gaining critical management information.

#### In-Season Catch Reporting

With approximately 100+ limited entry permit holders expected to fish during the 1988 sac-roe season, frequent aerial surveys and timely catch reports will continue to be an important management tool, particularly in areas that are not covered by field crews. Timely and accurate catch information provided by the processors

and fishermen will be essential in managing the fishery. Processors and independent tender operators will be required to provide daily tallies of herring deliveries by statistical area and processors must provide accurate estimates of herring onboard tenders that have not yet delivered to the cannery. Inaccurate or untimely information could result in the closure of an area. Individual code sheets will be provided for each tender or processor that is required to report catches on a daily basis by radio. Each tender operator and buyer must register with the Department prior to fishing and will be given a packet containing regulations, statistical charts, etc.

#### Guideline Harvest Level

The 1988 sac-roe harvest should be similar to that of 1981 and close to the average of the past seven (7) years; approximately 2,065 tons is expected to be harvested. If recruitment is above average in several major stocks or if virgin stocks are exploited, the actual harvest may well exceed the GHL. If, however, recruitment is generally weak area-wide and/or adverse weather conditions prevail throughout the season the actual harvest may be significantly less than the GHL.

The listing in Table 1, "GUIDELINE HARVEST LEVELS BY MANAGEMENT UNIT" will be used as an aid in making in-season management decisions. These harvest levels are meant to reflect the status of each listed stock, however, some stocks lack the data base needed for adequate evaluation. Consequently, annual harvest levels for these stocks may fluctuate considerably until their status is more clearly understood. Again, all fishermen, pilots and processors are encouraged to provide the ADF&G management staff with any information or estimates on stock size they may accumulate either in-season or post-season.

TABLE 1  
KODIAK HERRING SAC ROE FISHERY  
KODIAK GUIDELINE HARVEST LEVELS BY STOCK

STAT. AREA	MGMT. UNITS	1988 GUIDELINE HARVEST LEVEL	REQUIRED SPAWNING BIOMASS @ 10% EXPLOITATION	@ 20% EXPLOITATION
<u>AFOGNAK DIST.</u>				
A010	Raspberry Sts.	45 TONS	450 Tons	225 Tons
A020	Malina Bay	20 TONS	200 Tons	100 Tons
A031	Paramanof Bay	25 TONS	250 Tons	125 Tons
A032	Foul Bay	20 TONS	200 Tons	100 Tons
A040	Devils Inlet	10 TONS	100 Tons	50 Tons
A040	Blue Fox	10 TONS	100 Tons	50 Tons
A050	Offshore W. Afog. <sup>1/</sup>	-	<sup>1/</sup>	<sup>1/</sup>
A060	Shuyak Is.	20 TONS	200 Tons	100 Tons
A070	Perenosa Bay	15 TONS	150 Tons	75 Tons
A071	Delphin Bay	10 TONS	100 Tons	50 Tons
A072	Seal Bay	10 TONS	100 Tons	50 Tons
A080	Tonki Bay	10 TONS	100 Tons	50 Tons
A090	Izhut Bay	15 TONS	150 Tons	75 Tons
A091	Kitoi Bay	15 TONS	150 Tons	75 Tons
A092	MacDonalds Lagoon	10 TONS	100 Tons	50 Tons
A100	Danger Bay	30 TONS	300 Tons	150 Tons
A101	Litnik	15 TONS	150 Tons	75 Tons
A102	Duck Bay	10 TONS	100 Tons	50 Tons
<u>District Totals</u>		<u>17</u>	<u>290 TONS</u>	<u>2,900 Tons</u>
				<u>1,450 Tons</u>

STAT. AREA	MGMT. UNITS	1988 GUIDELINE HARVEST LEVEL	REQUIRED SPAWNING BIOMASS	
			@ 10% EXPLOITATION	@20% EXPLOITATION

UGANIK DIST.

UG10	Kupreanof	10 TONS	100 Tons	50 Tons
UG20	Viekoda	20 TONS	200 Tons	100 Tons
UG21	Terror	65 TONS	650 Tons	325 Tons
UG21	Uganik Is. Lagoon <sup>2/</sup>	0 TONS	<u>2/</u>	<u>2/</u>
UG30	Village Island	25 TONS	250 Tons	125 Tons
UG31	W. Uganik Pass	15 TONS	150 Tons	75 Tons
UG32	NE Arm Uganik	60 TONS	600 Tons	300 Tons
UG33	E. Arm Uganik	30 TONS	300 Tons	150 Tons
UG34	S. Arm Uganik	30 TONS	300 Tons	150 Tons
UG40	Offshore Uganik <sup>1/</sup>	-	<u>1/</u>	<u>1/</u>

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<u>District Totals</u>	<u>9</u>	<u>255 TONS</u>	<u>2,550 Tons</u>	<u>1,275 Tons</u>
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UYAK DISTRICT

UY10	Offshore Uyak <sup>1/</sup>	-	<u>1/</u>	<u>1/</u>
UY20	Harvester Island	10 TONS	100 Tons	50 Tons
UY30	Inner Uyak	190 TONS	1,900 Tons	950 Tons
UY30	Browns Lagoon	20 TONS	200 Tons	100 Tons
UY31	Larsen Bay	10 TONS	100 Tons	50 Tons
UY40	Zachar Bay	100 TONS	1,000 Tons	500 Tons
UY50	Spiridon Bay	160 TONS	1,600 Tons	800 Tons

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<u>District Totals</u>	<u>6</u>	<u>490 TONS</u>	<u>4,900 Tons</u>	<u>2,450 Tons</u>
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Appendix A.1. (page 14 of 19)

STAT. AREA	MGMT. UNITS	1988 GUIDELINE HARVEST LEVEL	REQUIRED SPAWNING BIOMASS	
			@ 10% EXPLOITATION	@20% EXPLOITATION
<u>ALITAK DIST.</u>				
AL10	Outer Alitak	(Exploration)	<u>3/</u>	<u>3/</u>
AL20	Inner Alitak	(Exploration)	<u>3/</u>	<u>3/</u>
AL21	Deadman Bay	100 TONS	1,000 Tons	500 Tons
AL30	Sulua/Portage Bay	40 TONS	400 Tons	200 Tons
AL40	Lower Olga/Moser	(Exploration)	<u>3/</u>	<u>3/</u>
AL50	Upper Olga Bay	190 TONS	1,900 Tons	950 Tons
AL60	Geese/Twoheaded	(Exploration)	<u>3/</u>	<u>3/</u>
<hr/>				
District Totals:		7 330 TONS	3,300 Tons	1,650 Tons

STURGEON/HALIBUT DIST.

SH10	Sturgeon/Halibut	(Exploration)	<u>3/</u>	<u>3/</u>
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GENERAL DISTRICT

G010	Kaiugnak	10 TONS	100 Tons	50 Tons
G020	W. Sitkalidak St.	(Exploration)	<u>3/</u>	<u>3/</u>
G021	Barling	15 TONS	150 Tons	75 Tons
G022	E. Sitkalidak St.	75 TONS	750 Tons	375 Tons
G023	Tanginak Anchorage	15 TONS	150 Tons	75 Tons
G030	Outer Sitkalidak	(Exploration)	<u>3/</u>	<u>3/</u>
G040	Outer Kiliuda	(Exploration)	<u>3/</u>	<u>3/</u>
G041	Inner Kiliuda	10 TONS	100 Tons	50 Tons
G042	Shearwater	15 TONS	150 Tons	75 Tons
G050	Outer Ugak	(Exploration)	<u>3/</u>	<u>3/</u>
G051	Inner Ugak	40 TONS	400 Tons	200 Tons
G060	Womens Bay	90 TONS	900 Tons	450 Tons
G070	Monashka/Mill B.	(Exploration)	<u>3/</u>	<u>3/</u>
G080	Anton Larsen	30 TONS	300 Tons	150 Tons
G081	Sheratin	15 TONS	150 Tons	75 Tons
G090	Kizhuyak	90 TONS	900 Tons	450 Tons
G100	Kalsin Bay	20 TONS	200 Tons	100 Tons
G101	Middle Bay	25 TONS	250 Tons	125 Tons

STAT. AREA	MGMT. UNITS	1988 GUIDELINE HARVEST LEVEL	REQUIRED SPAWNING BIOMASS	
			@ 10% EXPLOITATION	@20% EXPLOITATION
G102	Inshore Chiniak	10 TONS	100 Tons	50 Tons
G103	Spruce Island	10 TONS	100 Tons	50 Tons
District Total		20	470 TONS	4,700 Tons
				2,350 Tons

MAINLAND DIST.

M010	North Mainland	(Exploration)	<u>3/</u>	<u>3/</u>
M020	Inner Kukak	50 TONS	500 Tons	250 Tons
M030	Outer Kukak <sup>1/</sup>	-	<u>1/</u>	<u>1/</u>
M040	Inner Missak	(Exploration)	<u>3/</u>	<u>3/</u>
M040	Outer Missak <sup>1/</sup>	-	<u>1/</u>	<u>1/</u>
M050	Inner Katmai	50 TONS	500 Tons	250 Tons
M060	Outer Katmai <sup>1/</sup>	-	<u>1/</u>	<u>1/</u>
M070	Alinchak	30 TONS	300 Tons	150 Tons
M080	Puale Bay	(Exploration)	<u>3/</u>	<u>3/</u>
M090	Portage Bay	(Exploration)	<u>3/</u>	<u>3/</u>
M100	Outer Portage <sup>1/</sup>	-	<u>1/</u>	<u>1/</u>
M110	Wide Bay	100 TONS	1,500 Tons	500 Tons
M120	Lower Shelikof	(Exploration)	<u>3/</u>	<u>3/</u>
District Total		230 TONS	2,300 Tons	1,150 Tons

GRAND TOTAL	2,065 TONS	20,650 Tons	10,325 Tons
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.....

<sup>1/</sup>These are offshore management units which are not expected to yield herring of sac-roe quality. These units are more applicable to the food/bait fishery. (See Herring Food/Bait Fishery Management Plan.)

<sup>2/</sup>The spawning biomass has probably been reduced to less than 50 tons and the unit is closed to fishing.

<sup>3/</sup>There should be adequate biomass to justify the actual harvest; harvest should not exceed 20% of the available biomass.

TABLE 2.

# KODIAK HERRING SAC-ROE FISHERY FISHERY SUMMARY BY YEAR AND BY GEAR

YEAR	SEASON LENGTH DAYS	TOTAL HARVEST	BY GEAR		PERCENT		LANDINGS		NO. UNITS		AVG. \$'S	
			SEINE	G/N	SEINE	G/N	SEINE	G/N	SEINE	G/N	SEINE	G/N
1979	36	1735	1457	278	84	16	-	-	57	125	38,347	3,333
1980	35	2383	2009	374	84	16	-	-	92	109	14,978	2,573
1981	48	2083	1598	485	77	23	207	406	79	114	14,402	3,471
1982	59	1771	1447	324	82	18	138	191	45	67	17,819	2,719
1983	51	2319	1797	522	78	22	184	284	41	64	35,061	6,520
1984	54	2163	1691	472	78	22	138	212	39	69	34,691	5,467
1985	59	1988	1244	724	63	37	118	348	34	81	32,935	8,039
1986	61	1558	1110	448	71	29	132	385	31	71	34,010	6,002
1987	61	2146	1591	554	74	26	122	411	29	62	54,872	8,945
9 YEAR AVG.	52	2012	1549	463	77	23	113	249	50	85	30,791	5,230

TABLE 3.

## LIMITED ENTRY PERMIT STATUS AS OF JANUARY 1988

NUMBER PERMITS	SEINE			GILLNET			TOTAL		
	N.T.	T.	TOT.	N.T.	T.	TOT.	N.T.	T.	TOT.
Fishable Permits in 1987									
Interim-Use:	-	-	22	-	-	48	-	-	70
Permanent	4	40	44	0	59	59	4	99	103
TOTAL	-	40	66	-	59	107	-	99	173
Active Permits in 1987									
TOTAL	-	-	29	-	-	62	-	-	91

N.T. - Non-Transfer

T. - Transferable

1988

HERRING SAC-ROE SEASON  
ALASKA DEPARTMENT OF FISH AND GAME

KODIAK AREA MANAGEMENT STAFF

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Asst. Area Mgmt. Biologist

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Tom Dinnocenzo  
John Becker  
Tom Pearson  
Ralph Wright  
Larry Nicholson

REGIONAL SUPERVISOR:

Larry Nicholson

REGIONAL FINFISH COORDINATOR:

Pete Probasco

# KODIAK AREA HERRING STATISTICAL CHART

REVISED 1 MARCH 1985

THIS CHART IS PRINTED AS A COURTESY BY A.D.F. & G. AND IS INTENDED PRIMARILY AS A GUIDE FOR FISHERMEN AND INDUSTRY PERSONNEL TO USE WHEN REPORTING ON FISH TICKETS THE CORRECT STATISTICAL CATCH AREAS FOR EACH COMMERCIAL HERRING DELIVERY. FOR EXACT DESCRIPTIONS OF DISTRICTS AND SUBSECTIONS, CONSULT THE CURRENT ISSUE OF THE ALASKA COMMERCIAL FISHING REGULATIONS FOR HERRING.

## MAINLAND DISTRICT

MD10 NORTH MAINLAND  
MD20 INNER KUKAK  
MD30 OUTER KUKAK  
MD40 MISSAK  
MD50 INNER KATHAI  
MD60 OUTER KATHAI  
MD70 ALINCHAK  
MD80 PAULLE BAY  
MD90 PORTAGE BAY  
MD100 OUTER PORTAGE BAY  
MD110 WIDE BAY  
MD120 LOWER SHELTKOF

## UGANIK DISTRICT

UG10 KUPREANOF  
UG20 VIERDOA  
UG21 TERRON  
UG30 VILLAGE ISLANDS  
UG31 W. UGANIK PASS.  
UG32 NE. ARM UGANIK  
UG33 E. ARM UGANIK  
UG34 S. ARM UGANIK  
UG40 OFFSHORE UGANIK

## UYAK DISTRICT

UY10 OFFSHORE UYAK  
UY20 HARVESTOR ISLAND  
UY30 INNER UYAK  
UY31 LARSEN BAY  
UY40 ZACHAR BAY  
UY50 SPIRIDON BAY

## STURGEON/HALIBUT DISTRICT

SH10 NO SUBSECTIONS

## ALITAK DISTRICT

AL10 OUTER ALITAK  
AL20 INNER ALITAK  
AL21 DEADMAN BAY  
AL30 SULLIVAN/PORTAGE BAY  
AL40 LOWER OLGA/MOSER BAY  
AL50 UPPER OLGA BAY  
AL60 GEESE/TWOHEADED

## AFONAK DISTRICT

A010 RASPBERRY STRAITS  
A020 MALINA BAY  
A031 PARAMANOF BAY  
A032 FOUL BAY  
A040 BLUE POK  
A050 OFFSHORE WEST, AFONAK  
A060 SHAYAK ISLAND  
A070 PERENOSA BAY  
A071 DELPHIN BAY  
A072 SEAL BAY  
A080 TONKI BAY  
A090 IZHU BAY  
A091 KITOI BAY  
A092 McDONALDS LAGOON  
A100 DANGER BAY  
A101 LITNIK  
A102 INSHORE MARKET

## GENERAL DISTRICT

G010 KALUNAK  
G020 W. SITKALIDAK STRAITS  
G021 BARLING  
G022 E. SITKALIDAK STRAITS  
G023 TANGINAK ANCHORAGE  
G030 OUTER SITKALIDAK  
G040 OUTER KILLUDA  
G041 INNER KILLUDA  
G042 SHEARWATER  
G050 OUTER UGAK  
G051 INNER UGAK  
G060 NOKEN'S BAY  
G070 MONASHWA/HILLBAY  
G080 ANTON LARSEN  
G081 SHERATIN  
G090 KIZHIYAK  
G100 KALSIN BAY  
G101 MIDDLE BAY  
G102 INSHORE CHINTAK  
G103 SPRUCE ISLAND

Appendix A.1. (page 19 of 19)

FIGURE 1.

1988/89  
HARVEST STRATEGY FOR THE KODIAK MANAGEMENT AREA  
COMMERCIAL FOOD/BAIT HERRING FISHERY

By: Larry Malloy, Area Management Biologist  
Dave Prokopowich, Asst. Area Management Biologist

Regional Information Report<sup>1</sup> No 4K88-36

Alaska Department of Fish and Game  
Division of Commercial Fisheries, Westward Region  
211 Mission Road  
Kodiak, Alaska 99615

September, 1988

<sup>1</sup>The Regional Information Report Series was established in 1987 to provide an information access system for all unpublished divisional reports. These reports frequently serve diverse ad hoc informational purposes or archive basic uninterpreted data. To accommodate needs for up-to-date information, reports in this series may contain preliminary data.

## TABLE OF CONTENTS

<u>Item</u>	<u>Page</u>
Introduction.....	i
Season Opening Times and Dates.....	1
Fishing Periods.....	1
Permits Required.....	1
Regulations.....	1
Harvest Strategy.....	2
Guideline Harvest Levels.....	3
Reports Required by Fishermen.....	4
Table 1. Guideline Harvest Levels By Management Units.....	5
Table 2. Management Plan for the Shelikof Strait Food and Bait Fishery.....	9
Fig. 1. Geographical Area encompassed by management plan for Shelikof Straits food/bait fishery.....	10
Fig. 2. 1988/89 Statistical Chart/Food-Bait Management Units Chart.....	11

Introduction:

- This harvest strategy attempts to answer most pertinent pre-season and in-season questions regarding the Kodiak food/bait herring fishery.
- This fishery targets both Kodiak and Kamishak spawning stocks which are present in the Kodiak Area during the food/bait season (8/1 - 2/28).
- Since the herring sac-roë fisheries in the Kodiak and Cook Inlet areas are closed-to-entry fisheries, they are treated as primary fisheries and are managed to provide for the majority of the harvest on the affected stocks to occur in these fisheries. The food/bait fisheries on these same stocks are subsequently treated as secondary fisheries and associated harvest levels are directly related to the results of the sac-roë fisheries on these stocks; food/bait harvest levels generally will not exceed 10% of the sac-roë harvest on any of these stocks. Consequently, consideration is given to the biological concerns associated with "double dipping" fisheries on the same stock and is also given to the 200+ limited entry permit holders for both Kodiak and Cook Inlet sac-roë fisheries whose economic interests in permits could be adversely affected without a specific allocative directive for each fishery.
- A Board of Fisheries regulatory change in March 1988 resulted in the directive to manage the Kodiak Area food/bait fishery in a manner which considers the aforementioned concerns. Specifically management is guided by the following new regulation:

5 AAC 27.535

- a) The department shall manage the herring food/bait fishery directed on Kodiak spawning stocks so that the food/bait harvest does not exceed 10% of the previous sac-roë season's actual harvest on each stock.
- b) The department shall manage the food/bait herring fishery directed on Kamishak spawning stocks, which over-winter in the Eastern Shelikof Straits, so that the harvest does not exceed 2% (two) of the total available spawning biomass of Kamishak stocks as determined by the department during the most recent sac-roë season.

1. SEASON:

- August 1, 1988 through February 28, 1989.

2. FISHING PERIODS:

- Open to continuous fishing from 12:01 A.M. 8/1/88 to 12:00 P.M. 2/28/89 unless superseded by emergency order closures.

3. CLOSED WATERS:

- See CLOSED WATERS section of the 1988 Commercial Herring Regulation book (page 29).

4. PERMITS REQUIRED (2):

A. Interim Use Permits for legal gear:

- H01K Purse Seine
- H34K Gillnet
- H07K Trawl

B. Registration Permit - Kodiak ADF&G Office

- Permit will be used for:
  - Monitoring fleet size by gear type.
  - Clarifying catch reporting procedures, closed water areas, and in-season emergency order announcement procedures.
- Both permits are available at the Kodiak Fish and Game office.

5. LEGAL GEAR RESTRICTIONS:

- 01 - Purse Seines
  - Maximum length: 100 fathoms
  - Maximum depth: 1,000 meshes (herring web)
  - Leads allowed during food/bait season.
- 34 - Gillnets
  - Maximum length: 150 fathoms; mesh size: 2-1/8" - 2-1/2".
- 07 - Trawl
  - No restrictions
- Consult the 1988 Herring Regulation book for a complete listing of all regulations.

6. HARVEST STRATEGY:

Regulation 5 AAC 27.535(a)(b), as approved by the Alaska Board of Fisheries in March 1988, describes a harvest strategy for the Kodiak Area food/bait fishery which provides for:

- A secondary food/bait harvest, following a primary sac-roë harvest, on both Kodiak spawning stocks and on Kamishak spawning stocks which occur in the Kodiak Management Area during the Kodiak food/bait season (8/1 - 2/28).
- An exclusion of a food/bait harvest on Kodiak stocks in that portion of Shelikof Straits associated with the occurrence of Kamishak stocks as depicted in Fig. 1, except that a harvest on Kodiak stocks may occur in the aforementioned units if the harvest occurs in in-shore areas (bays) prior to a closure of these areas based upon the G.H.L. for Kamishak stocks being achieved.
- An exploratory harvest scenario on unidentified stocks which occur in areas not covered by the two aforementioned provisions.

To accommodate this harvest strategy, thirteen (13) food/bait management units have been established to include geographical groupings of sac-roë stocks and adjacent offshore areas (See Fig. 2).

- For each management unit there is a Guideline Harvest Level (G.H.L.) which reflects the combined G.H.L.'s for Kodiak stocks included within each food/bait unit (See Table 1).
- Six of these food/bait units have also been identified and consolidated into a geographical grouping representing that area where the food/bait harvest on Kamishak stocks will most likely occur (See Fig. 1).

The 1988 food/bait G.H.L. for the Kodiak Area will be affected by the following management considerations:

- For Kodiak spawning stocks, the department will generally limit the food/bait harvest to 10% of the previous spring's sac-roë harvest on a stock by stock basis. Variations to this strategy are depicted in Table 1 with explanations listed in the Table's footnotes. Harvest levels on Kodiak stocks in the adjacent offshore areas will reflect the combined food/bait G.H.L. for the sac-roë stocks included within that management unit. See Table 1 for a listing of G.H.L.'s by stock and by management unit.
- For identified non-Kodiak spawning stocks, the department will control the harvest to insure that a particular stock is not overexploited. At this time, Kamishak Bay spawning stock(s) are the only identified non-Kodiak spawning stock(s) which occur in the Kodiak Management Area during the Kodiak food/bait season (8/1 - 2/28).
  - In the case of Kamishak Bay spawning stock(s) where evidence exists that they are present in Kodiak area waters during the food/bait season, the harvest level will not be allowed to exceed 591 tons. This tonnage is approximately 2% of the 1988 Kamishak Bay pre-sac-roë season total available indexed spawning biomass (sac-roë harvest: 5,548 s.t. plus post-season indexed spawning biomass 29,548 s.t.)

- Management of Kamishak stocks for both the sac-roe and food/bait fisheries is outlined in Table 2.
- During the food/bait fishery, the Department will attempt to identify the location of Kamishak stock(s) in Kodiak Area waters via data collected from the commercial fishery and/or the ADF&G vessel M/V Resolution during its hydroacoustical surveys which target Shelikof Straits herring biomasses; the M/V Coho may also be required to assist in this search.
- All herring samples obtained from either source will be expeditiously worked-up to apply A-W-L comparisons between Kodiak and Kamishak stocks.
- Biomass estimates will be obtained from the fishery via skipper interviews as to stocks, distribution, average school size, estimated number of schools, etc! Biomass estimates will also be obtained acoustically from the M/V Resolution surveys.
- Herring harvested in this fishery from the following management units will be identified as either Kodiak stocks (per regulation 5 AAC 535(2) or as Kamishak stock(s).
  - These areas include F/B 1, F/B 2, F/B 4, F/B 5, F/B 11 and F/B 12 as depicted in Figure 1.
- Herring harvested from the aforementioned food/bait management units, where the harvest occurred in in-shore (bays) locations, will be considered to be Kodiak stocks unless A-W-L and/or biomass data indicates otherwise, in which case they will be considered to be Kamishak stocks.
- If the harvest ceiling of 591 tons on Kamishak stocks is achieved, all of the aforementioned management units would be closed to herring fishing for the remainder of the food/bait season.
- For non identified herring stocks which may occur in off-shore locations in the remaining food and bait management units, the department will control the harvest to insure that a particular stock is not overexploited. Actual harvest levels may be determined by harvest location, biomass observed and age-weight-length information.

7. GUIDELINE HARVEST LEVELS:

- For the 1988/89 food/bait season the following harvest levels will be in effect:
  - For Kodiak spawning stocks: Per regulation 5 AAC 27.535(a) as described under "Harvest Strategy", a maximum of 286 tons properly distributed by stock throughout the management area will be the food/bait harvest on Kodiak spawning stocks.
    - See Table 1 for harvest projections by stock.
  - For Kamishak spawning stocks: Per regulation 5 AAC 27.535(b) as described under "Harvest Strategy", a maximum of 591 tons harvested from that portion of Shelikof Straits depicted in Figure 1 (see attached) will be the food/bait harvest ceiling on Kamishak spawning stocks which occur in the Kodiak Area during the food/bait season (8/1 - 2/28).

- Prior to harvesting Kamishak stocks in the aforementioned area, a harvest on Kodiak stocks may occur per regulation 5 AAC 27.535(a).
  - Herring harvested in inshore (bays) locations will be considered to be Kodiak stocks unless A-W-L sampling and/or biomass information indicates otherwise, in which case they will be considered to be Kamishak stocks.
- For unidentified stocks: No guideline harvest levels are established, however the remaining 123 tons of the regulatory 1,000 ton G.H.L. cited in the 1988 commercial herring regulation book would be expected to occur on these stocks, if justified by stock(s) strength.
  - Harvest levels per geographically distinct biomasses will be established in-season per information obtained from A-W-L sampling and from "skipper" interviews detailing estimates of biomass strength, seasonal distribution, school size, etc!

8. REPORTS REQUIRED BY FISHERMEN:

- All landings of herring for food/bait purposes must be verbally reported to ADF&G before the product is totally unloaded at the dock.
  - The following phone numbers will reach Fish and Game personnel 24 hours per day:
    - ADF&G Office: Monday through Friday  
8:00 A.M. to 4:30 P.M. - 486-4791
    - After Office Hours:
      - 4:30 P.M. to 8:00 A.M. - 486-4251 (Larry Malloy)
      - 486-6007 (Dave Prokopowich)

All fish tickets must be completed and sent in to the Kodiak Fish and Game office within a week of the landing.

- Send to: Alaska Department of Fish and Game  
211 Mission Road  
Kodiak, Alaska 99615

Table 1.

KODIAK MANAGEMENT AREA  
1988/89 HERRING FOOD/BAIT HARVEST STRATEGY  
A LISTING OF GUIDELINE HARVEST LEVELS BY FOOD/BAIT MANAGEMENT UNITS<sup>1/</sup>

Food/Bait Mgmt. Units	Sac-Roe Management Units		1988 Sac-Roe		1988/89 Food/Bait
	No.	Name	G.H.L.	Harvest	G.H.L.
F/B 1	A010	Raspberry	45.0	47.1	4.5
West Afognak Unit	A020	Malina	20.0	52.4	2.0 <sup>2/</sup>
	A031	Paramanof	25.0	53.4	2.5 <sup>2/</sup>
	A032	Foul Bay	20.0	3.4	2.0
	A040	Blue Fox	20.0	1.5	2.0
	A050	Offshore Afognak	-	0.0	5 <sup>/</sup>
UNIT TOTALS:			130.0	157.8	13.0
F/B 2	A060	Shuyak	20.0	0.0	20.0 <sup>4/</sup>
North Afognak Unit	A070	Perenosa	15.0	19.1	1.5
	A071	Delphin	10.0	4.6	1.0
	A072	Seal Bay	10.0	0.0	1.0 <sup>5/</sup>
	A080	Tonki	10.0	16.9	1.0 <sup>2/</sup>
UNIT TOTALS:			65.0	40.6	24.5
F/B 3	A090	Izhut	15.0	20.3	1.5
East Afognak Unit	A091	Kitot	15.0	13.5	1.5
	A092	McDonalds	10.0	10.6	1.0
	A100	Danger	30.0	40.6	3.0
	A101	Litnik	15.0	17.0	1.5
	A102	Inshore Marmot	10.0	0.0	10.0 <sup>4/</sup>
UNIT TOTALS:			95.0	102.0	18.5
F/B 4	UG10	Kupreanof	10.0	1.7	8.0 <sup>4/</sup>
Uganik Unit	UG20	Viekoda	20.0	24.9	2.0
	UG21	Terror	65.0	107.7	6.5
	UG30	Village Islands	25.0	26.5	2.5
	UG31	W. Uganik Passage	15.0	32.8	1.5
	UG32	N.E. Arm Uganik	60.0	74.8	6.0
	UG33	E. Arm Uganik	30.0	45.0	3.0
	UG34	S. Arm Uganik	30.0	44.3	3.0
	UG40	Offshore Uganik	-	0.0	5 <sup>/</sup>
UNIT TOTALS:			255.0	357.7	32.5

Table 1. (continued)

Food/Bait Mgmt. Units	Sac-Roe Management Units		1988 Sac-Roe		1988/89 Food/Bait
	No.	Name	G.H.L.	Harvest	G.H.L.
F/B 5 Uyak Unit	UY10	Offshore Uyak	-	0.0	6/
	UY20	Harvester	10.0	0.6	9.0 <sup>4/</sup>
	UY30	Inner Uyak	210.0	225.9	21.0
	UY31	Larsen Bay	10.0	0.7	9.0
	UY40	Zachar	100.0	113.8	10.0
	UY50	Spiridon	160.0	157.5	16.0
UNIT TOTALS:			490.0	498.5	65.0
F/B 6 Sturgeon/ Halibut Unit	SH01	Sturgeon/Halibut	Exploration	0.0	Exploration
	UNIT TOTALS:			0.0	-
F/B 7 Alitak Unit	AL10	Outer Alitak	-	0.0	
	AL20	Inner Alitak	Exploration	2.7	Exploration
	AL21	Deadman	100.0	104.9	10.0
	AL30	Sulua	40.0	48.0	4.0
	AL40	Lower Olga/Moser	Closed		0.0
	AL50	Upper Olga/Moser	190.0	191.4	19.0
	AL60	Geese/Twoheaded	Exploration	7.0	Exploration
UNIT TOTALS:			330.0	354.0	33.0
F/B 8 Eastside Unit	G010	Kaiugnak	10.0	22.8	1.0
	G020	W. Sitkalidak	Exploration	25.0	Exploration
	G021	Barling	15.0	17.7	1.5
	G022	E. Sitkinak	75.0	92.7	7.5
	G023	Tanginak	15.0	6.4	1.5 <sup>5/</sup>
	G030	Outer Sitkalidak	-	0.0	-
	G040	Outer Kiliuda	Exploration	4.0	Exploration
	G041	Inner Kiliuda	10.0	6.9	1.0
	G042	Shearwater	15.0	16.7	1.5
	G050	Outer Ugak	Exploration	34.6	Exploration
	G051	Inner Ugak	40.0	30.1	4.0
UNIT TOTALS:			180.0	256.9	18.0

Table 1. (continued)

Food/Bait Mgmt. Units	Sac-Roe Management Units		1988 Sac-Roe		1988/89 Food/Bait
	No.	Name	G.H.L.	Harvest	G.H.L.
F/B 9	G060	Womens Bay	90.0	89.6	9.0
	G100	Kalsin Bay	20.0	5.2	2.0
Chiniak	G101	Middle Bay	25.0	4.2	2.5
Unit	G102	Inshore Chiniak	10.0	0.0	10.0 <sup>A/</sup>
UNIT TOTALS:			145.0	99.0	23.5
F/B 10	G070	Monashka/Mill Bay	Exploration	0.0	Exploration
	G080	Anton Larsen	30.0	20.7	3.0
North Kodiak	G081	Sheratin	15.0	.5	14.0
Unit	G090	Kizhuyak	90.0	108.9	9.0
	G103	Spruce Island	10.0	.6	9.0 <sup>A/</sup>
UNIT TOTALS:			145.0	130.7	35.0
F/B 11	M010	North Mainland	Exploration	0.0	Exploration
	M020	Inner Kukak	50.0	76.8	5.0
North Mainland	M030	Outer Kukak	-	0.0	Exploration
Unit	M040	Missak	Exploration	0.0	Exploration
UNIT TOTALS:			50.0	76.8	5.0
F/B 12	M050	Inner Katmai	50.0	37.8	5.0
	M060	Outer Katmai	-	0.0	Exploration
Mid-Mainland	M070	Alinchak	30.0	32.3	3.0
Unit	M080	Puale Bay	Exploration	0.0	Exploration
	M090	Portage Bay	Exploration	0.0	Exploration
UNIT TOTALS:			80.0	70.1	8.0
F/B 13	M100	Outer Portage	-	0.0	Exploration
South Mainland	M110	Wide Bay	100.0	26.7	10.0 <sup>B/</sup>
Unit	M120	Lower Shelikof	-	0.0	Exploration
UNIT TOTALS:			100.0	26.7	10.0
GRAND TOTALS:			2,065.0	2,170.8	286.0

\*See footnotes on next page.

FOOTNOTES:

- 1/The Kodiak Area total G.H.L. for food/bait, as indicated in the 1988 Herring Regulation book is 1,000 s.t. However, as indicated under the regulatory harvest strategy, these stocks exploited during the sac-roë season are managed to retain approximately 10% of the available harvest for the food/bait fishery. This table reflects the available food/bait harvest for each sac-roë stock or food/bait unit, whichever applies. (See Harvest Strategy.)
- 2/Sac-roë management units where excessive sac-roë harvests may have occurred either this year or in the past and where a reduced food/bait harvest is justified.
- 3/Sac-roë management units where the sac-roë harvest substantially exceeded pre-season expectations probably as a result of increased stock abundance rather than overharvest and where an increased food/bait harvest commensurate with the increased sac-roë fishery is justified.
- 4/Sac-roë management units where a sac-roë underharvest may have occurred and where an increased food/bait harvest is justified. In some cases where the stock status is in question the increased food/bait harvest may still be less than pre-season expectations on those stocks.
- 5/Sac-roë management units where the sac-roë harvest was substantially less than pre-season expectations probably as a result of an overestimation of stock strength and where a reduced food/bait harvest is justified.
- 6/See attached plan for management of the Kamishak Bay Herring Spawning Stocks in the Shelikof Straits Food and Bait Fishery.

Table 2.

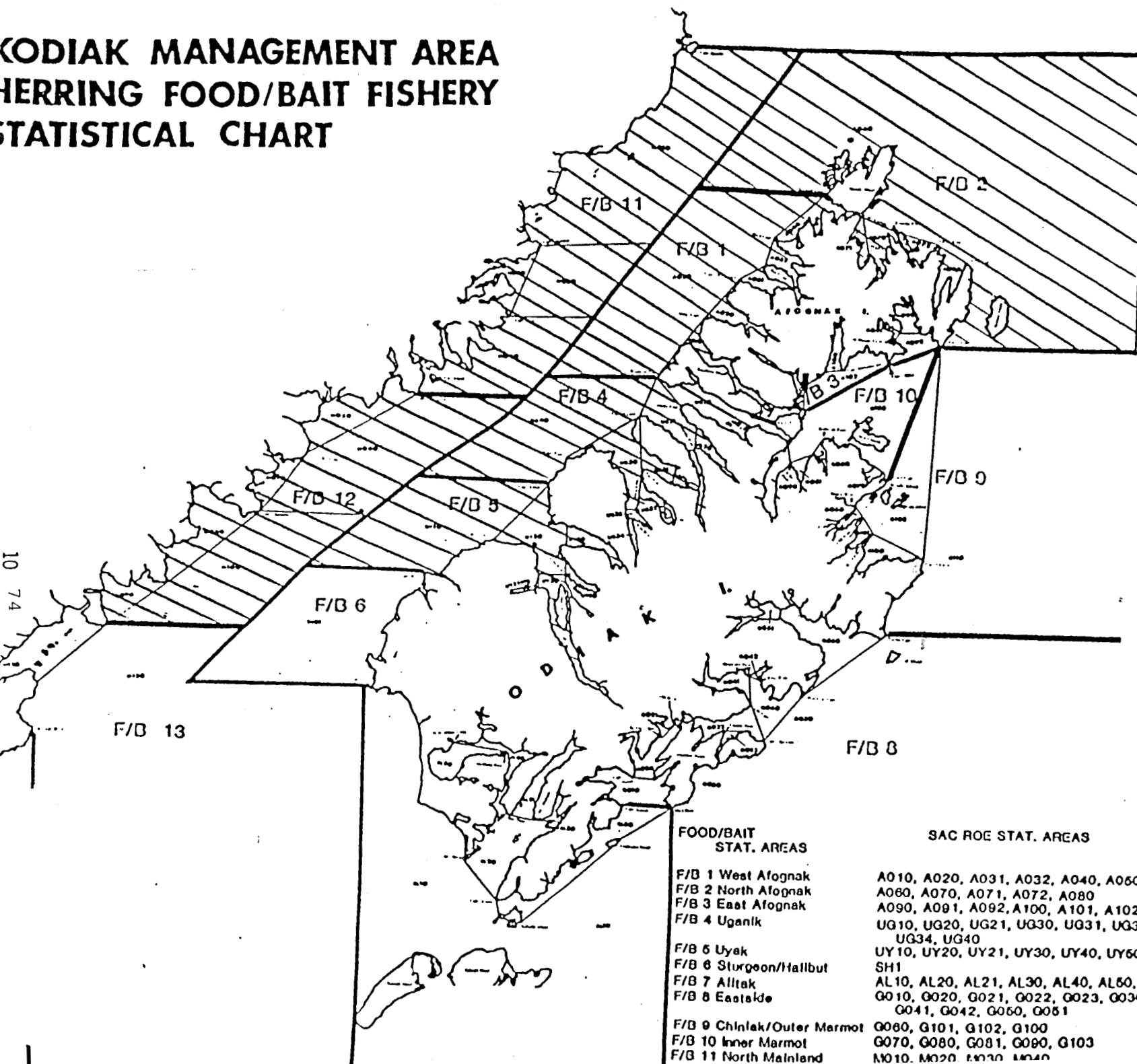
MANAGEMENT OF THE KAMISHAK BAY HERRING SPAWNING STOCKS  
IN THE SHELIKOF STRAIT  
FOOD AND BAIT FISHERY

Addendum to the 1988 Kamishak Bay  
Herring Management Plan

Kamishak Bay herring spawning stocks support both the Kamishak Bay sac-ro-e fishery and the Shelikof Strait food and bait fishery. Pursuant to the Board of Fisheries decision to allocate 2% of the Kamishak Bay herring spawning biomass to the Shelikof Strait food and bait fishery, the following adjustments will be made to the 1988 Kamishak Bay sac-ro-e fishery management plan to accommodate the Board's actions and to protect the Kamishak Bay herring stock from over harvest:

- 1) ADF&G guidelines direct that herring harvest rates be kept at or below 20% of the current best estimate of biomass, depending upon stock strength and age composition. Best estimates of biomass of the Kamishak Bay herring stock are currently determined by aerial survey following the spring sac-ro-e fishery. Therefore, harvest levels in the Shelikof Strait food and bait fishery will be based on this estimate of spawning biomass.
- 2) The harvest ceiling for the Shelikof Strait food and bait fishery will be 2% of the best estimate of the total Kamishak biomass, as determined by the Department during the most recent Kamishak herring sac-ro-e season. The total Kamishak Bay biomass will be determined by the best estimate of the spawning biomass following the sac-ro-e fishery plus the total harvest from the sac-ro-e fishery.
- 3) Present management strategy for the Kamishak Bay spawning stocks attempts to achieve a maximum harvest rate on older fish of 20% while keeping the harvest rate of fish age 5 and younger at or below 10%.
- 4) If ADF&G determines the harvest rate for the stock of Kamishak Bay herring should be less than 20%, either due to a decrease in biomass, weak year classes, or poor recruitment, the 2% food and bait harvest ceiling will be reduced proportionally. [i.e. If the biological markers (decrease in biomass, weak year classes, or poor recruitment) indicate that the sac-ro-e harvest needs to be reduced, for example to 15%, the food and bait fishery would be reduced to 1.5%]
- 5) If the spawning biomass of the Kamishak Bay herring stocks falls below the biological threshold level of 8,000 tons, both the Kamishak Bay sac-ro-e and the Shelikof Strait food and bait fishery will be closed or severely limited.

# KODIAK MANAGEMENT AREA HERRING FOOD/BAIT FISHERY STATISTICAL CHART



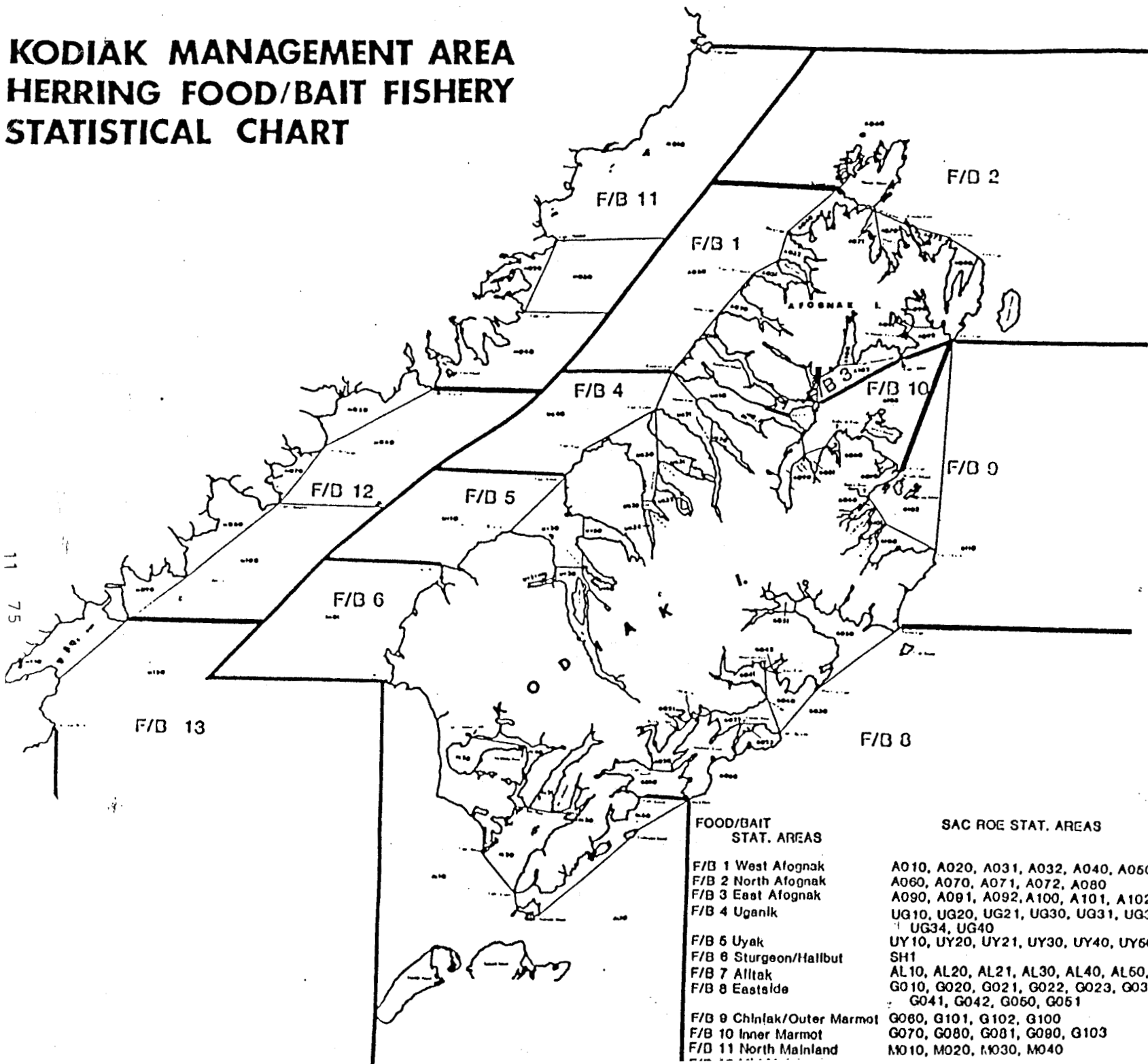
## FOOD/BAIT STAT. AREAS

F/B 1 West Afognak  
F/B 2 North Afognak  
F/B 3 East Afognak  
F/B 4 Uganik  
F/B 5 Uyak  
F/B 6 Sturgeon/Hallbut  
F/B 7 Allak  
F/B 8 Eastside  
F/B 9 Chinik/Outer Marmot  
F/B 10 Inner Marmot  
F/B 11 North Mainland

## SAC ROE STAT. AREAS

A010, A020, A031, A032, A040, A060  
A060, A070, A071, A072, A080  
A090, A091, A092, A100, A101, A102,  
UG10, UG20, UG21, UG30, UG31, UG32, UG33,  
UG34, UG40  
UY10, UY20, UY21, UY30, UY40, UY50  
SH1  
AL10, AL20, AL21, AL30, AL40, AL50, AL60  
G010, G020, G021, G022, G023, G030, G040,  
G041, G042, G050, G051  
G060, G101, G102, G100  
G070, G080, G081, G090, G103  
M010, M020, M030, M040

# KODIAK MANAGEMENT AREA HERRING FOOD/BAIT FISHERY STATISTICAL CHART



## FOOD/BAIT STAT. AREAS

F/B 1 West Afognak  
F/B 2 North Afognak  
F/B 3 East Afognak  
F/B 4 Uganik

F/B 5 Uyak  
F/B 6 Sturgeon/Hallbut  
F/B 7 Alltak  
F/B 8 Eastside

F/B 9 Chnifak/Outer Marmot  
F/B 10 Inner Marmot  
F/B 11 North Mainland

## SAC ROE STAT. AREAS

A010, A020, A031, A032, A040, A050  
A060, A070, A071, A072, A080  
A090, A091, A092, A100, A101, A102,  
UG10, UG20, UG21, UG30, UG31, UG32, UG33,  
UG34, UG40  
UY10, UY20, UY21, UY30, UY40, UY60  
SH1  
AL10, AL20, AL21, AL30, AL40, AL60, AL80  
G010, G020, G021, G022, G023, G030, G040,  
G041, G042, G050, G051  
G060, G101, G102, G100  
G070, G080, G081, G090, G103  
M010, M020, M030, M040

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